



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Sandra Darling
Serial No. 10/660,282
Filed: 09-10-2003
For: Method for Aligning Instruction and Content to Increase Learning
Docket No.: 51346-3
Group Art Unit: 3713
Examiner: Cameron Saadat
Confirmation No.: 5302

Commissioner For Patents
Post Office Box 1450
Alexandria, VA 22313-1450

DECLARATION UNDER RULE 1.131

I, Sandra K. Darling, do hereby declare and say:

1. I am the inventor in the above-referenced application. My home address is 743 West Nolan Way, Chandler, AZ, 85248.

2. My invention in the above-referenced applicant was conceived and reduced to practice before the November 27, 2002, filing date of U.S. Patent 6,808,392 to Walton.

3. I conceived my invention in 1998; after reviewing a draft report by Robert Marzano and published by the Mid-continent Regional Education Laboratory (McREL), I determined to use the expounded meta-analysis in a method to align instructional strategies with standards or benchmarks. I requested and received permission to reproduce Marzano's material in connection with my process. Attachments 1 and 2 are letters from McREL granting permission, received in March and April 1999.

4. Thereafter, I proceeded to develop a methodology to systematically prepare a database that could be used to align benchmarks and instructional strategies in accordance with Marzano's knowledge domains and brain processing function categories. In early 2000, I assembled a team to undertake the task of classifying teaching practice and classifying learning benchmarks, then

mapping teaching practices to the benchmarks. Attachment 3 is an exchange of email correspondence on February 17, 2000, with one of my team members. Attachment 4 is a March 7, 2000, message from me to the team outlining the tasks in implementing my method.

5. Attachment 5 is an alignment meeting agenda for performing the alignment tasks on April 6-9, 2000. The bulk of the alignment was done in the summer of 2000, but the process of refining, checking and making consistent the database continued into 2001.

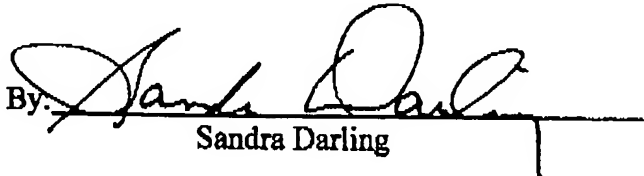
6. In January 2001 I sent a draft patent specification to my attorneys. While admittedly rough, this draft included all the steps in what is now my claimed method. Attachment 6 is my cover email and the accompanying draft specification.

7. In mid-2001 I convinced the Minneapolis Public School System to undertake a pilot study of the impact of applying my alignment method at certain low-performing elementary schools. The effect of implementation of my aligned instruction strategies was evaluated in detail by McREL over a two-year period. Attachment 7 is a copy of the study agreement with McREL.

8. In connection with that study, I personally delivered an aligned instructional intervention plan to Bryn Mawr Elementary school on September 10, 2001. This was the first application of my method in a live environment. Attachment 8 is a partial copy of the plan.

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patents issuing thereon.

February 8, 2007

By: 
Sandra Darling

ATTACHMENT 1



Making a Difference

*in the quality of education and learning for all through
excellence in applied research, product development, and service.*

Permission to Reprint

March 18, 1999

Permission is hereby granted to Learning Bridges to use in EDCI 542, "Instructional Strategies That Impact Academic Achievement" the following material, which was published by Mid-continent Regional Educational Laboratory:

Effect sizes reported in *A Theory-Based Meta-Analysis of Research on Instruction*, by Robert Marzano. Aurora, CO: McREL, 1998.

The material being used should be cited in the following manner:

Marzano, Robert (1998). *A Theory-Based Meta-Analysis of Research on Instruction*. Aurora, CO: McREL. Reprinted with permission of McREL.

It should also be included in the bibliography, if any.

This permission is for noncommercial use only, expires on one year from the above date and may be renewed only by obtaining further written permission from McREL. This permission is also limited to the use and materials specified above. Any change in the use or materials from that specified above requires additional written permission from McREL before such use is made.

This report can be purchased for \$20 including shipping and handling from McREL, ATTN: Resource Center, 2550 S. Parker Road, Suite 500, Aurora, CO 80014.

Sincerely,

Linda Brannan
Senior Associate

cc: D.Frost

ATTACHMENT 2



Making a Difference

*in the quality of education and learning for all through
excellence in applied research, product development, and service.*

Learning Bridges
743 West Nolan Way
Chandler, AZ 85248

Permission to Use McREL Material

April 13, 1999

Permission is hereby granted to Learning Bridges to use in its workshops the following material which was produced by McREL:

Marzano, Robert (1999). *A Theory-Based Meta-Analysis of Research on Instruction*.

The material should be cited in the following manner:

Marzano, Robert (1999). A Theory-Based Meta-Analysis of Research on Instruction. Aurora, CO: McREL. Online: www.mcrel.org/standards/ Used by permission of McREL. Online: www.mcrel.org/standards/articles/meta.asp

It should also be included in the bibliography, if any.

This permission relates to the use of this material in Learning Bridges workshops, including:

- Brain, Behavior & Student Responsibility
- Constructing Meaning and Making Connections: Human Brain & Learning
- Dimensions of Learning, Brain Research & Instruction
- Teaching the Way the Brain Learns
- Strategic Teaching and Learning

This permission expires on one year from the above date and may be renewed only by obtaining further written permission from McREL. This permission is also limited to the use and materials specified above. Any change in the use or materials from that specified above requires additional written permission from McREL before such use is made.

Sincerely,

David B. Frost
Vice President, New Business Planning and
New Market Development

Mid-continent Regional Educational Laboratory
2550 South Parker Road, Suite 500 • Aurora, CO 80014-1678
303-337-0990 • fax: 303-337-3005
www.mcrel.org

ATTACHMENT 3

Dr. Sandra Darling

Email on Team to
build the database
& obtain research
& store it. Info
Put into "Big Book"

From: "Michelle Beach" <beachmi@mhd1.moorhead.msus.edu>
To: "Dr. Sandra Darling" <sdarling@learningbridges.com>
Sent: Thursday, February 17, 2000 8:32 PM
Subject: Re: The Incredible Dream Team

Hi Kiddo!

My preference is choice B, Thursday March 30 - Sunday April 2. I teach classes all day Mondays, so choice A wouldn't work so well.

Now you ask if that is my final choice, and announce that my answer is correct and I win a million dollars!

:) Michelle

"Dr. Sandra Darling" wrote:

The Incredible Dream Team consists of these 9 members: Kris Nei - knei@learningbridges.com Marcia Schuldt - mschuldt@learningbridges.com Michelle Beach - beachmi@mhd1.moorhead.msus.edu Donna Tileston - dwtileston@yahoo.com Nancy Oelklaus - noelklaus@aol.com Rhia Roberts - rhia11@netzero.net Gwen Doty - boss302@northlink.com Terri Mesna - tmesna@palomar.edu Sandy Darling - sdarling@learningbridges.com WE ARE GOING TO BUILD THE DATABASE THAT GENERATES THE INSTRUCTIONAL INTERVENTION PLAN.

That's our mission. Here's how we will do it. **Task 1:** Determining what is an instructional strategy. Who: Kris will work with others to provide a clear definition of "Instructional Strategy" that will guide our search. That team will use concept attainment to help them with definition. **Task 2:** Identifying the instructional strategies that need to go into the database. Who: THE ENTIRE TEAM How: I will send you for starters, bibliographies from Marzano's Meta-Analysis, from Models of Teaching, and anything else I can get my hands on. YOU have many, many more. Send them. We will split up the work. For instance, I will divide up the 30 - 40 pages of research studies from Models of Teaching, and send SOME to each of you (minus Terri and Rhia - who have different jobs). We researchers will pull the research from ERIC, the Net, and anyplace else we can find some. Once identified, we will pull specific data (which I will list for you) and send it via e-mail to Rhia Roberts. Our goal as researchers is to have identified over a thousand instructional strategies, grounded in research, to put into our database. **WHAT DOES RHIA NEED FROM EACH OF THE RESEARCH STUDIES ON INSTRUCTION?**

1. Name of the Instructional Strategy 2. Short Description of the Instructional Strategy (2 - 3 sentences) 3. Long Description of the Instructional Strategy (1 paragraph) 4. Citation for the Research (you know...author, title, etc.) 5. Mean of the experimental group on whatever measure they're using 6. Mean of the control group of whatever measure they're using 7. Standard deviation of the control group. (Rhia said they usually report this, but if they report individual scores, then send those and she will compute the standard deviation) 8. Number of People in the student - n = number 9. Length of the experiment - timewise 10. Training of the experimenters. Whoever is participating in doing the instructional strategy, were they given training, and if so, what was it. 11. The reliability and validity of the tests used in the study. For example, if they used a test to measure a change in reading or math, what is the reliability and validity of that test. If they don't provide that, be sure to put the test names in. Rhia has the reliability and validity data on a number of tests and can look it up. 12. The gender of the participants, if available. So there are 12 things that we need to pull from each study. We send these 12 things for each study to Rhia Roberts through e-mail. **Task 3:** Computation of Effect Size and Percentile Gain Scores for every instructional strategy submitted. Rhia will use Glass' methodology to compute these two scores. Who: Rhia Roberts **Task 4:** Putting all of this data into an Access Database for safe-keeping. Who: Terri Mesna - Terri will put all of the researchers' 12 things plus 2 more pieces of data from Rhia into an Access database. Each instructional strategy will have a number for identification. Terri will also enter the McREL Mathematics and Language Arts Standards into the Access Database. **Task 5:** Mapping the Instructional Strategies to the McREL Standards in Language Arts and Mathematics. The Incredible Dream Team will get together

Big Book

the last week of March (let me know if your preference) Choice A: Sunday, March 26 - Wednesday, March 29 Choice B: Thursday, March 30 - Sunday, April 2 We will take 2 days to achieve consensus on which strategies are mapped to which McREL Language Arts standards. We will take 2 days to achieve consensus on which strategies are mapped to which McREL Mathematics standards. Terri will put the identification numbers of the mapped strategies in a separate field by standard. **Task 6 Celebrate!! We will have all of the raw data ready for the technician to build our custom database to generate the Instructional Intervention Plan. Do you think it is possible for the 7 of us to EACH come up with 215 strategies supported by research by the third week of March? Can we tap enough resources to do that? Shall we give it a try? YOU BETCHA.....a MNism.** I will get the bibliographies copied and out in the mail TOMORROW. Please do not think it's an inclusive list. You all have many, many more. I know you'll all feel like you're back in school working on your master's or doctorate all over again. I promise you...if we can get this done together, we shall share in the rewards together, too. Print out and save this sheet so you have a list of everyone's e-mail addresses. Periodically, I'll have Terri let us know how far we are...how many are in the database. She'll have the number. Let's go for it! Sandra K. Darling, Ph.D.

Learning Bridges

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ATTACHMENT 4



March 7, 2000

TO: Kris Nei
Marcia Schuldt
Michelle Beach
Donna Tileston
Nancy Oelklaus
Rhia Roberts
Gwen Doty
Bruce Laird
Terri Mesna

FROM: Sandy Darling

RE: Instructional Database

I've heard from almost all of you regarding the April 6 – 9, 2000 dates. Hopefully, by the end of today, I'll have heard from all of you. The purpose of this note to all of you is four-fold:

1. Outline the tasks with a strategy for accomplishing them.
2. Define a timeline for completion
3. Propose a compensation plan with its risks and contingencies
4. Get a firm commitment from you on participation.

I've learned a couple of things, and Nancy Oelklaus was really helpful in defining this job, too. The tasks before us, as I see it now, are these:

TASK and STRATEGY	TIMELINE
TASK ONE Identify all of the “ Teaching Practices ” or “ Professional Practices ” that we can from a) our research, b) our own experiences, and c) from our own resources. I will send you the list that I have from Marzano’s meta-analysis with their accompanying effect sizes for you to examine. Teaching practices are those behaviors that teachers do which are alterable (in other words,	By March 31, 2000 we will have as many teaching practices as possible with supporting research in an Access database with at least one supporting citation as to the research base which supports it. Some

<p>Learning Bridges could provide instruction on them and the teaching practices would change).</p> <p>If your identified teaching practices have been supported by research which indicates its effectiveness or impact on learning, please see if you can find the data in order for Rhia Roberts to compute the effect size on it. You already have that information from me. Many, many new teaching practices (particularly those which were identified from research on the brain, multiple intelligences, etc.) have <u>not</u> had effect size studies done on them. We will include them in our "list" anyway. Those teaching practices (without effect size studies) are supported by other types of research and best practice studies.</p> <p>Some teaching practices address variables that impact on academic achievement in a general way, but are not specific to language arts or mathematics. INCLUDE THEM. We will put them into a category for Other Practices Which Impact Achievement (or a better title if we can think of one). These might include tutoring, classroom climate issues, classroom management issues, etc.</p> <p>TO DO: E-MAIL YOUR LISTS OF TEACHING PRACTICES TO TERRI MESNA AT</p> <p><u>tmesna@palomar.edu</u></p> <p>IF YOUR TEACHING PRACTICE HAS AN IDENTIFIED "EFFECT SIZE," INCLUDE THAT AS WELL IN YOUR E-MAIL TO TERRI.</p>	<p>of the teaching practices will have an Effect Size associated with them as well; some will not.</p> <p>By March 10, 2000 you should have a copy of Sandy's notes on the meta-analysis with their accompanying Effect Sizes by Priority Mail.</p>
<p>TASK TWO Identify resources where there is information on these teaching practices, i.e., books, articles, research studies, web sites, videos, etc.</p> <p>Each teaching practice will have many, many references which support it. You may personally not have all of them. Other team members can contribute resources, books, articles, research studies, web sites, etc. to the teaching practice that you submitted.</p> <p>We will all use APA format as the acceptable means</p>	<p>March 31, 2000 – A list of bibliographic resources will exist in an Access database. Each of the resources will have a unique, identifying number assigned by Terri (as she creates that table in the database from the material that you</p>

<p>of submitting bibliographic data so that there is uniformity in what the customer sees.</p> <p>Examine the references which were sent to you (the big pack!) for possible sources which support the teaching practices you submit. Include them where you can.</p> <p>TO DO: E-MAIL YOUR BIBLIOGRAPHIC DATA TO TERRI MESNA AT</p> <p><u>tmesna@palomar.edu</u></p> <p>IF THE RESEARCH HAS DATA FROM WHICH AN EFFECT SIZE MAY BE COMPUTED, E-MAIL THAT DATA TO RHIA ROBERTS AT</p> <p><u>rhia11@netzero.net</u></p>	<p>submit.) That identifying number will be "attached" or "assigned" to all of the teaching practices which the bibliographic source supports.</p>
<p>TASK THREE Review the McREL Standards and Benchmarks for grade level clusters of: a) K – 2, 3 – 5, 6 – 8, and 9 – 12 in Language Arts and Mathematics. These are the content standards against which we will align. Sandy will be responsible for getting each of you a copy of them.</p> <p>TO DO: KNOW AND UNDERSTAND WHAT THE CONTENT STANDARDS (AT THE GRADE LEVEL CLUSTER LEVEL) MEAN PRIOR TO THE MAPPING MEETING.</p>	<p>Friday, March 10, 2000 you should have the McREL Language Arts and Mathematics Content Standards.</p>

<p>TASK FOUR Writing long and short descriptions of the teaching practices as they would apply to the mathematics and language arts content standards (from the McREL grade level clusters).</p> <p>Nancy Oelklaus has graciously volunteered to assist with this task. If you need help, please contact her at noelklaus@aol.com</p> <p>or 1-800-717-2723 X14. The phone number is for work, so use discretion <u>please</u>.</p> <p>The descriptions of the teaching practices will be different for a K – 2 math standard than a 9 – 12 standard, and perhaps different for language arts and mathematics. Focus on the application of the specific learning being asked for in the benchmark standard.</p> <p>We will be “mapping” teaching practices to the benchmark standards by the grade level clusters, and not just the standard statement itself. The resulting information will be more useful to classroom teachers. (Thanks to Nancy for this valuable suggestion!)</p> <p>TO DO: E-MAIL YOUR LONG <u>AND</u> SHORT DESCRIPTIONS OF THE TEACHING PRACTICES TO TERRI MESNA AT</p> <p>tmesna@palomar.edu</p> <p>THEY MAY BE MORE GENERIC DESCRIPTIONS AT THIS POINT IN TIME, SINCE WE WILL NOT HAVE MAPPED THEM TO CONTENT YET. WE WILL RE-WRITE THEM FOR THE SPECIFIC BENCHMARK STANDARDS FOLLOWING THE MAPPING PROCESS.</p>	<p>March 31, 2000 the long and short descriptions of the teaching practices will be entered into an Access database.</p> <p>Please remember to get them to Terri with enough time for her to do the data entry coming from all of you. We want HER job done prior to the mapping meeting.</p>
<p>TASK FOUR – Mapping of the teaching practices to the benchmark standards of McREL in both language arts and mathematics.</p> <p>By this time, we will have a number of things in our database for safe-keeping:</p> <p>a) McREL’s standards and benchmarks (by grade</p>	<p>April 6 – 9, 2000</p>

<p>level clusters) Terri will have assigned them a unique, identifying number.</p> <ul style="list-style-type: none"> b) Teaching practices (Terri will have assigned them a unique, identifying number.) c) Descriptions (long and short) of teaching practices d) Effect Sizes for <u>SOME</u> of the teaching practices e) Percentile Gains for <u>SOME</u> of the teaching practices f) Bibliographic Data which has been assigned to teaching practices <p>For TWO days, we will map the list of teaching practices to the 223 mathematics benchmarks. For TWO days, we will map the list of teaching practices to the 275 language arts benchmarks.</p> <p>We will accomplish this, as a team, based upon our professional judgment utilizing all of the knowledge and experience that we bring to the table. Worksheets will be provided for our use.</p> <p>Bring any resources to the task that you feel may be useful.</p> <p>TO DO: AT THE LEARNING BRIDGES OFFICES, THE TEAM WILL MEET FOR 4 DAYS TO “ALIGN” <u>INSTRUCTION TO STANDARDS</u>.</p>	
<p>TASK SIX The results of the mapping will be entered into the Access database for safe-keeping. Terri will do this from our worksheets.</p> <p>TO DO: TERRI ONLY Data Entry</p>	<p>Friday, April 21, 2000</p> <p>The unique numbers of the teaching practices are assigned to the benchmark standards.</p>
<p>TASK SEVEN Rewrite the teaching practices descriptions to best fit the grade level clusters of McREL benchmark standards for language arts and mathematics. These rewritten teaching practices will be entered into the database.</p> <p>TO DO: REWRITE THE TEACHING PRACTICES DESCRIPTIONS. E-MAIL THE REWRITTEN DESCRIPTIONS TO TERRI AT</p>	<p>May 5, 2000</p> <p>Final teaching practices descriptions are entered into the Access database.</p>

<p><u>tmesna@palomar.edu</u></p> <p>FOR ENTRY INTO THE DATABASE.</p>	
<p>TASK EIGHT Rank ordering the teaching practices in order of their impact on learning based on a) the professional judgment of the Team, and b) the Effect Size when available. The rank-ordering of the teaching practices will be under the McREL benchmark clusters. A pair-weighting process will be utilized by each member individually. The paired weighting forms and directions will be mailed to each member of the team to be completed. Responses will need to be returned to Learning Bridges by May 15, 2000. The composite created by Sandy will be the team's final rank order.</p> <p>TO DO: COMPLETE THE PAIRED WEIGHTING FORMS TO RANK ORDER THE TEACHING PRACTICES A) UNDER EACH OF THE 223 MATH BENCHMARKS AND B) UNDER EACH OF THE 275 LANGUAGE ARTS BENCHMARKS. MAIL THE COMPLETED FORMS TO LEARNING BRIDGES IN THE ENVELOPES PROVIDED.</p> <p>CREATE THE COMPOSITE: SANDY ONLY ENTER THE RANKING INTO THE DATABASE FOR EACH OF THE BENCHMARKS – TERRI ONLY</p>	<p>May 19, 2000</p> <p>The teaching practices are assigned a ranking number within each benchmark standard.</p>
<p>ALL DATA WILL BE READY FOR THE DATABASE BUILD ITSELF</p>	<p>May 19, 2000</p>

COMPENSATION AND RISKS

Learning Bridges is seeking funding from a variety of sources, including business partnerships (Classroom Connect, Intel, Apex, Wrrr), venture capital (EduVentures, Bluefire, St. Paul Companies, Vulcan Ventures), AZ Small Business Association loan, offering a specialized deal to Nebraska, Crowne Point Technologies and X-Nova (Chuck Lowry and Bob Weathers) are looking at possible funding for us, and even some of you have contacted organizations and individuals to explore funding options. Classroom Connect and Apex have already indicated a willingness to work with us to take our product to market IF we have the database built. The U.S. Department of Education (OERI) has

indicated it will pay for the research evaluation project part of the proposal because they WANT the database to exist.

As Nancy said, we're stirring the pot a lot; it WILL make good soup. However, right now Learning Bridges does not have the money to pay for your time. What I am proposing is this: When, AND IF, we get the funding for our project, I will pay each of you **\$15,000** for your contribution to this project. It will be a "work for hire" sort of deal. You will not own the database; Learning Bridges will. The risk for you is that we may not get funding to do the database build itself, which is a minimum of \$150,000 to \$200,000.

Basically, if we get funded, you get paid. If we do not get funded, you will not get paid. That is the risk you need to evaluate for yourself.

I know that, personally, I believe right to the bottom of my toes that we will find funding. I have leveraged every asset that I have, except my sons (but they've had to help, too). I want this venture to be successful because it will make a difference in teaching and learning, and I care about that very deeply as do you. I also want this venture to be successful because I want Learning Bridges to make money...lots...why not? It has taken tenacity, courage, tears, tolerance for ambiguity and uncertainty, and sometimes, laughing out loud, to get this far...not just for me, but for every one of you who has been a part of this Learning Bridges journey to "Become a Bridge to a New Way of Teaching and Learning." We have been supported and encouraged by educators and business people all over the country, some of whom have given dearly of their time and expertise in their belief in Learning Bridges. My biggest fear is to quit one month too early!

When we get funded, our first endeavor (besides beginning the database build which will generate the Instructional Intervention Plan) will be to engage in Strategic Planning. The entire Learning Bridges Team will be invited to participate in establishing a five year Strategic Plan to "Plant our Flag into the Future." We will complete an action plan that identifies the roads we will take to achieve our vision. There are many options for being a part of Learning Bridges if we map our journey well. We can create options for you to share in the benefits as well.

But, first things first (as Covey would say), we need to get the data to build the database. I need a commitment from you to take the risk, and to share your gifts to make it happen. I don't want to assume. After you've looked over those big 8 tasks to be done, **please let me know this week** if you are willing to be a part of this task...and what a task it is!!

I am grateful and humbled by your support for me and for Learning Bridges. You can count on me to do my part to the very best of my ability.

Thank you for being you!

ATTACHMENT 5

LEARNING BRIDGES™
INSTRUCTIONAL DATABASE ALIGNMENT
Confidential Property of Learning Bridges™
April 6 - 9, 2000

AGENDA

Thursday, April 6

8:00	Continental Breakfast
8:30	Review of Process
	Confidentiality Statements
9:00	Combining/Synthesizing Teaching Practices
10:00	Alignment to 223 Math Benchmark Standards
12:00	Lunch
1:00	Continue Math Alignment
5:00	Happy Hour with Margaritas
	3 P's
	Lasagna Dinner
	For the 3 P's - bring in 3 items which represent something Personal, something Professional and something that represents your Passion. We'll get to know each other better with the sharing, and it'll be fun!

Friday, April 7

8:00	Continental Breakfast
8:30	Continue Math Alignment
12:00	Lunch
1:00	Continue Math Alignment
5:00	Adjourn - Dinner on your own

Saturday, April 8

8:00	Continental Breakfast
8:30	Alignment to 275 Language Arts Benchmarks
12:00	Lunch
1:00	Continue Language Arts
5:00	Adjourn - Dinner on your own

Sunday, April 9

9:30	Continental Breakfast
10:00	Continue Language Arts
12:00	Lunch
1:00	Continue Language Arts
4:00	Next Steps
5:00	Adjourn

I know you all have varying times you have to leave. We'll try to coordinate with you. I'm really looking forward to seeing all of you, and beginning the first steps of creating an Aligned Instructional Database. The weather is SUPPOSED to be in the 80's so bring shorts! Sandy

Arrival Times

Michelle - Wednesday, April 5th - 1:29 PM
Terri - Friday, April 7th - 9:00 PM
Marcia - Thursday, April 6th - 8:32 PM
Gwen - Thursday, April 6th - 12:00 PM
Bruce - Wednesday, April 5th - 7:24 PM
Kris - Tuesday, April 4th - 5:55 PM
Donna - Wednesday, April 5th - 2:45 PM

ATTACHMENT 6

Mott, Joseph W.

From: Dr. Sandra K. Darling [sdarling@learningbridges.com]
Sent: Tuesday, January 09, 2001 1:19 PM
To: Mott, Joseph W.
Cc: Chuck Lowry
Subject: Patent
Attachments: Patent Application.doc; Non-Provisional Application for a Patent.doc

Dr. Mr. Mott,

Attached are 2 documents to start the patent application process. I have a couple of questions, and you probably will have many after looking at them.

- a) Patent Application (I tried to make it like the form required. Are you the "Applicant" or is Learning Bridges?)
- b) Non-Provision Application for a Patent...I'm not sure this is what you need, but with your guidance, I'll get it right.

Call me. 480-883-0704 Thanks! S

2/8/2007

INVENTOR INFORMATION

Inventor One Given Name:: Sandra Kay

Family Name:: Darling

Postal Address Line One:: 743 W Nolan Way

City:: Chandler

State or Province:: AZ

Postal or Zip Code: 85248

Citizenship Country:: USA

Given Name of Applicant:: Joseph W

Family Name: Mott

Authority Under _____:: 11

(This blank is 1.42 or 1.43 or 1.47)

Postal Address Line One:: 2 N Central Ave, Ste 1600

City:: Phoenix

State or Province:: AZ

Postal or Zip Code:: 85004-2393

City of Residence:: _____

State or Prov. Of Residence:: AZ

Citizenship Country:: USA

CORRESPONDENCE INFORMATION

Correspondence Customer Name:: Jennings Strouss & Salmon PLC

Address Line One:: 2 N Central Avenue, Ste 1600

City:: Phoenix

State or Province:: AZ

Postal or Zip Code: 85004-2393

Telephone:: 602-262-5866

Fax:: 602-495-2643

Electronic Mail:: jmott@jsslaw.com

APPLICATION INFORMATION

Title Line One:: Alignment of Instructional or Training

Title Line Two:: Strategies with Specific Kinds of

Title Line Three:: Knowledge (e.g., Declarative and

Title Line Four:: Procedural) Based on How the Brain

Title Line Five:: Processes Specific Kinds of

Title Line Six:: Knowledge in Rank Order Based on

Title Line Seven:: Effect Size on Learning.

Application Type:: Utility ????

Docket Number:: _____

Secrecy Order in Parent Appl.?: No

REPRESENTATIVE INFORMATION

Representative Customer Number: _____

Registration Number One: _____

Registration Number Two: _____

CONTINUITY INFORMATION

This application is a: Non Prov. Of Provisional ????

PRIOR FOREIGN APPLICATIONS

Non-Provisional Application for a Patent

- (1) A written document which comprises a specification (description and claims), and an oath or declaration;
- (2) A drawing in those cases in which a drawing is necessary; and
- (3) A filing fee.

Process or Concept Patent Idea

Title:

Alignment of Instructional or Training Strategies with Specific Kinds of Knowledge (e.g., Declarative and Procedural) Based on How the Brain Processes Specific Kinds of Knowledge in Rank Order Based on Effect Size on Learning.

Theoretical Underpinnings

Knowledge

The knowledge domains include information, mental processes, and psychomotor skills. Learning expectations that address knowledge (e.g., State Content Standards for K – 12, McREL Compendium of Standards) encompass two types of knowledge - declarative and procedural - which are defined by Robert J. Marzano in “A Theory Based Meta-analysis of Research on Instruction”

(1998). The brain's linguistic processor "encodes experience into memory as propositions organized into declarative and procedural networks. These networks encode the 'what' of human knowledge and the 'how to,' both mental and physical" (p. 45). Marzano further defines declarative and procedural knowledge in Designing Standards-Based District, Schools, and Classrooms (Marzano and Kendall, 1996). "Declarative knowledge can be thought of as 'information' and usually involves component parts....Procedural knowledge consists of skills, strategies, and processes." The brain processes these two types of knowledge differently. This has implications for choosing instructional strategies to teach both kinds of knowledge based on how the brain processes each type of knowledge.

Brain Processing

The three systems of brain processing are the cognitive (which includes storage and retrieval processes, basic information processing, communication and knowledge utilization), metacognitive (which includes goal specification, process specification, process monitoring, and disposition monitoring), and the self system (which includes self-attributes, self and others, nature of the world, efficacy, and purpose – along with a mechanism that notes the difference between the desire status and the perceived status (Marzano, 1998, p. 107). Marzano reported three implications of brain processing of specific kinds of knowledge on classroom instruction. "Implication #1: Teachers should identify the knowledge and skills that are the targets of instruction....Implication #2:

Teachers should identify and use specific instructional techniques for specific instructional goals....Implication #3: Teachers should regularly utilize instructional techniques that apply to all types of instructional goals” (pp. 201 – 208).

Effect Size

The difference between an experimental and control group on the dependent measure into a standardized metric is referred to as an “effect size.” (Glass, 1976, 1978; Glass & Smith, 1979; Glass, McGraw & Smith, 1981) This is used when conducting a meta-analysis. The advantage is that effect sizes can be compared across studies that use different dependent measures. Marzano (1998) states that the effect size metric is useful because “it is standard deviation units and can, therefore, be interpreted as a change in the percentile ranking of the ‘average’ subject in the experimental group.”

The instructional strategies chosen to be aligned to content standards (knowledge) had an Effect Size based on meta-analyses research representing 30,000+ studies. The instructional strategies were ranked for effectiveness using a Paired Weighting Process based on Effect Size and the professional judgment of content and instructional specialists.

The Process

State Content Standards for language arts and mathematics were examined to determine the type of knowledge they were expecting of students, i.e., declarative, procedural, as well as the type of brain processing required to demonstrate learning, i.e., storage and retrieval, information processing, etc. Thousands of teaching practices (instructional strategies) were identified that addressed the identified type of brain processing for a specific type of knowledge. The Effect Size of the instructional strategies was determined from the meta-analyses of research on instruction to identify the impact on learning in language arts and mathematics.

The ranges identified for the Impact on Learning were:

.01 - .40 = Low which at most takes learning to the 66th percentile which is below mastery.

.40 - .80 = Moderate which at most takes learning to the 79th percentile which is right below the mastery level.

.81 – 1.3 = High which at most takes learning to the 90th percentile – significantly above mastery.

1.31+ = superior which will take learning from the 91st percentile to the 99th percentile – usually considered superior in grading, too.

The teaching practices were mapped to the content standards in language arts and mathematics based on the type of brain processing required to demonstrate learning of a specific type of knowledge.

Example of Mapping

What is the standard?	What kind of knowledge is represented by the standard?	How does the brain process that kind of knowledge?	What strategy addresses that kind of brain processing for that kind of knowledge?
<p>Language Arts Standard (or category) 6 – Demonstrates competence in the general skills and strategies for reading a variety of literary texts.</p> <p>Grades 3 – 5 (Level II)</p> <p>Knows the defining characteristics of a variety of literary forms and genres (e.g., fairy tales, folktales, fiction, nonfiction, myths, poems, fables, fantasies, historical fiction, biographies, autobiographies.)</p>	<p>Declarative Knowledge</p> <p>“Declarative knowledge can be thought of as “information” and usually involves component parts. For example, knowledge of the concept of ‘democracy’ includes an understanding that decisions are made by the people, that each person has a single vote, that votes are weighted equally, and so on. They involve an understanding of terms and concepts.” (Marzano, 1996)</p>	<p>Information Processing Function of the Cognitive System– information being declarative knowledge about concepts, principles, ideas, or generalizations</p>	<p>Concept Attainment is an information processing teaching practice for discovering the identifying characteristics and discriminating attributes of a concept, principle, generalization or idea, and for reflecting on how the learning occurred.</p>

The number of teaching practices for each grade level (benchmark) standard was reduced to 25 and NO teaching practices were included that did not have at least a moderate Impact on Learning. The 25 teaching practices or instructional strategies were then rank ordered by their Impact on Learning using both the Effect Size and professional judgment of content and instructional specialists.

The result of the Process is a database of the top 25 teaching practices for the benchmark (grade level) standards of 49 states, ranked by the Impact on Learning (Effect Size), that specifically meet the type of brain processing required to learn the type of knowledge stated in the benchmark standard.

Claim

The alignment of instructional teaching practices to content standards and benchmarks has never been done. A review of the research underway and a review of the literature currently published was conducted by Sandra K. Darling and David Frost (Vice President for New Business Development, Mid-continent Research on Education and Learning – McREL).

The alignment of teaching practices to state content standards and benchmarks based on brain processing (for a specific type of knowledge) has never been done.

The identification of the top teaching practices that are ranked for effectiveness (Effect Size) in learning state content standards and benchmarks has never been done.

Further Research

Researchers at the Mid-continent Research on Education and Learning (McREL) and Learning Bridges have applied for a Field Initiated Study (FIS) from the Office of Educational Research Institute (OERI) to measure the effectiveness of two (2) products originating from this concept and process: Learning Bridges Instructional Intervention Plan and Learning Bridges Web-Enabled Training on Instruction. Both are aligned to the specific content standards and benchmarks of 49 states.

Respectfully Submitted:

Sandra K. Darling, Ph.D.

ATTACHMENT 7

AGREEMENT

This Agreement is made this 28th day of August, 2001, by and between Learning Bridges ("Company") and the Mid-continent Laboratory, Inc. identified above ("Contractor").

ARTICLE I

Purpose and Scope of Work

1.1 The purpose of this Agreement is to engage Contractor to perform the services described in the Scope of Work attached hereto as Schedule A and made a part hereof.

1.2 Contractor shall at all times act in good faith and use its best efforts to perform all of the work provided for in this Agreement.

ARTICLE II

Payments to CONTRACTOR

2.1 Company shall pay for all services provided and associated expenses incurred by Contractor under this Agreement on a fixed price basis the total sum of one hundred sixty one thousand seven hundred eight dollars (\$161,708.00).

2.2 Payments to Contractor shall be made at the times, in the manner and upon the conditions set forth in the Payment Schedule attached hereto as Schedule B and made a part hereof.

ARTICLE III

Term and Termination

3.1 The period of this Agreement shall be from August 15, 2001 through September 30, 2003.

3.2 This Agreement may be terminated in whole or in part, at any time and for any reason, by either party at its discretion or for its convenience, upon at least 30 days prior written notice to the other party. In the event of such termination, Contractor shall be compensated under this Agreement through the effective date of termination, provided a final invoice is received by Company no later than 60 days after such date.

3.3 In the event of any breach of this Agreement by either party, or in the event either party is unable to perform any substantial part of this Agreement, this Agreement may be terminated immediately by either party by written notice to the other.

3.4 If this Agreement is terminated by reason of a breach by either party, the other party shall be entitled to all available legal, equitable and administrative remedies for such breach, including without limitation, the right to all damages resulting from such breach and the right to an injunction restraining or compelling action in accordance with this Agreement.

ARTICLE IV

Reports and Audit

4.1 Company and any of their duly authorized representatives, shall have full and timely access to all books, documents, papers, records and accounts of Contractor that are pertinent to this Agreement for the purpose of conducting such audits and examinations, or of making such excerpts or copies, as the examining party deems appropriate. Each party shall bear all of its own expenses in connection with any such audit, examination or copying, unless any such audit or examination reveals any knowing breach of this Agreement by Contractor or negligence of Contractor, in which event Contractor shall bear all costs of such audit or examination in addition to any other damages or liabilities resulting from such breach or negligence.

ARTICLE V

Ownership, Intellectual Property, and Pre-existing Works

5.0 Subject to Section 5.2, Company shall own the materials provided by McREL in connection with the Scope of Work shown on Schedule A. However, Contractor shall retain all right, title and interest to its intellectual property embodied in or by such materials, and to its pre-existing works, consultations, trainings, analyses, theories, models, publications, research, evaluations, or assessments.

5.2 Notwithstanding Section 5.1, if in connection with this Agreement, Contractor modifies or improves any materials that were created, published or copyrighted by Contractor prior to the effective date of this Agreement, and if such modifications or improvements are not so substantial as to make the modified or improved material a derivative work, then Contractor shall retain its ownership and copyright with respect to such material.

ARTICLE VI

General Provisions

6.1 Contractor represents and warrants as follows:

(a) Contractor is incorporated in and in good standing with the state of Colorado and is duly authorized to conduct business and is in good standing in each other state in which it shall conduct any activities under this Agreement.

(b) Contractor has full power and authority to enter into this Agreement and carry out all of its terms and provisions.

(c) This Agreement has been duly authorized by all necessary institutional action and represents the legally binding and fully enforceable obligation of the Contractor, and the person entering into and executing this Agreement on behalf of Contractor are fully authorized to do so.

(d) No part of this Agreement or of any activity to be undertaken by Contractor hereunder shall violate or otherwise be inconsistent with any provision of

(i) Contractor's articles of incorporation or bylaws,

(ii) any contract, covenant, representation, warranty, license or indenture made by or otherwise applicable to Contractor,

(iii) any judicial or administrative order or ruling applicable to Contractor, or

(iv) any statute, rule or regulation applicable to Contractor or to Contractor's activities under this Agreement.

6.2 In connection with its performance of this Agreement, Contractor shall comply with all applicable Federal and state laws, regulations, standards, orders and requirements.

6.3 All notices, reports and other written communications to either party under this Agreement shall be hand delivered or shall be mailed, postage prepaid, by first-class, registered or certified mail, or sent by private courier or express company, to the address noted for each party at the beginning of this Agreement, or shall be transmitted by fax to the number noted for each party. Delivery shall be deemed to have occurred on the earlier of actual receipt by the recipient or, in the case of mailing, three days after deposit with the United States Postal Service. Either party may change its address or fax number for purposes of this Agreement at any time by written notice to the other party.

6.4 In performing its services hereunder, Contractor is an independent contractor. Nothing herein shall create any partnership or joint venture between the parties or be construed as establishing any employment relationship. Contractor shall have no authority to speak for, act on behalf of or in any way bind or obligate Company, except as may be otherwise expressly provided herein.

6.5 This Agreement may not be amended, modified or supplemented except by a written instrument signed by the party sought to be bound thereby.

6.6 Contractor may not assign all or any portion of this Agreement, or any of its rights, powers, duties or obligations hereunder, without the express written consent of Company.

6.7 This document, together with all schedules, contains the entire Agreement of the parties with respect to the subject matter hereof and supersedes all prior communications, representations and agreements.

6.8 Neither party shall limit or exclude any person from participation in any activity under this Agreement on the basis of race, color, creed, national origin, sex or disability.

6.9 This Agreement is made in Aurora, Colorado and shall be governed by the laws of the State of Colorado. The parties consent to venue in the courts of either Arapahoe County, Colorado or Denver County, Colorado with respect to any dispute arising hereunder.

6.10 Points of contact shall be as follows:

Dr. Sandra K. Darling
Learning Bridges
743 W. Nolan Way
Chandler, AZ 85248
Telephone: 480-883-0704
Fax: 780-883-0705

Dr. Elisabeth Palmer
Mid-continent Laboratory, Inc.
2550 S. Parker Road, Suite 500
Aurora, CO 80014-1678
Telephone: 303-632-5559
Fax: 303-337-3005

IN WITNESS WHEREOF the parties have executed this Agreement on the dates set forth below to be effective as of the date first above written.

Learning Bridges

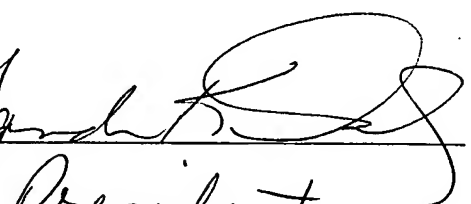
By:

Date

9/11/01

Name:

Title:


President

Mid-continent Laboratory, Inc.

By:

Date:

9/12/01

Name: Louis F. Cicchinelli, Ph.D.

Title: Executive Director

SCHEDULE A

Background

In an effort to raise student achievement, two public elementary schools in an urban school district in Minnesota have opted to enroll their teachers in a standards-based, online teacher professional development model created by Learning Bridges. This evaluation will follow participating teachers, and teachers at control sites, over a two-year period to examine the impact of this professional development model on teacher and student learning.

Purpose of the Evaluation

The overall purpose of the proposed evaluation is to assess the impact of the Learning Bridges standards-based professional development model on teaching and learning.

The primary evaluation questions are:

1. How was the Learning Bridges professional development model *implemented*?
2. To what extent is participation in the Learning Bridges online professional development model related to changes in *teacher knowledge and skills*?
3. To what extent is participation in the Learning Bridges online professional development model related to higher levels of *student achievement*?

Review of the Literature

Characteristics of Quality Teacher Professional Development

The National Staff Development Council (NSDC, 2000) has established 27 standards for effective staff development to support schools and districts in heeding its call to provide staff development grounded in research. As described by Hirsch (2000), these standards are organized into three areas: context, process, and content. The context standards refer to organizational characteristics that support the implementation and effects of professional development, such as strong leadership to obtain support and motivate staff. The process standards discuss how professional development should be delivered, such as opportunities for teachers to work collaboratively. Finally, the content standards refer to educator knowledge and skills that should be addressed, such as preparing teachers to use research-based teaching strategies appropriate to their teaching contexts. Although these standards were designed to guide schools and districts in identifying quality professional development, the NSDC advocates that regardless, the effectiveness of staff development should be judged by its influences on student achievement.

For the past several years, researchers have sought to identify the attributes of effective professional development. In a national survey of 1000 teachers who participated in the federal Eisenhower program for professional development in math and science, Birman, Desimone, Porter, and Garet (2000) asked teachers to describe the effects of their staff development experiences on their knowledge and skills and on the changes they had made in teaching practices. Based on the results, the researchers described

effective staff development as having appropriate duration, subject-matter content, active teacher learning, coherence with school improvement, and collective teacher participation. The researchers noted, however, that only a small minority of teachers had participated in staff development that had all of these characteristics. In a study by Borko et. al. (1997), teachers were introduced to instructional practices in a workshop, and then tried out the strategies in their classrooms, followed by discussion at a later workshop. This was an effective approach: teachers' professional knowledge is developed and intertwined with classroom context which helps support the transfer of general principles of teaching to applications in the classroom (Putnam & Borko, 2000). Roskos and Bain (1998) examined other elements of professional development in assessing the degree to which such opportunities stimulate and support teachers' thinking and reflection. In their study of 16 elementary school teachers participating in professional development on curriculum models, the extent to which the teachers had the opportunity to be intellectually engaged and to think about and discuss new concepts was important to teacher learning. Wilson and Berne (1999) documented the positive effects of professional development involving teacher collaboration. Thompson and Zeuli (1999), however, pointed out that collaboration by itself does not necessarily improve teacher learning. Based on these and other studies, quality professional development has come to be associated with learning opportunities that include: active teacher engagement and reflection, direct applications to the classroom, teacher collaboration, sufficient duration, and alignment with school improvement goals.

Despite these findings, Guskey (1997) noted that the research to date has resulted in neither clear nor definitive answers about how professional development can result in school improvement and lasting change. The reasons for this lack of clarity about the impact of professional development are: "1) confusion about the criteria of effectiveness, 2) the misguided search for main effects, and 3) the neglect of quality issues" (p. 34). The most common criteria for professional development effectiveness are the participant approval ratings of a program, changes in attitudes, and the degree to which the new skills were actually implemented; student learning is rarely examined (Guskey, 1997). The emphasis on the main effects of professional development (i.e., those that are commonly reported across programs) obscures important knowledge about the conditions under which staff development is most likely to influence student learning. Finally, most studies document only the presence or absence of desired features, such as teacher collaboration, and not the quality of these features, such as the intensity, duration, or fidelity of implementation. According to Guskey, finding the answer to what makes for effective professional development requires more studies that include rigorous research designs.

Professional Development and Standards-Based Education

The nature of professional development is also being shaped by the adoption of K-12 content standards by states. As described by Hawley and Valli (1999), the new higher standards require students to acquire more complex knowledge and problem-solving skills than in the past, and consequently, instruction needs to have a greater emphasis on student understanding. Teachers in standards-based school systems must be able to address curricular outcomes, prepare students for standards-based assessments, design lessons that cover complex content and result in deep student understanding, provide opportunities for discussion, practice effective classroom management, and assure that all students achieve (Wilson & Ball, 1996, p. 122). These teachers, however, do not feel prepared to meet the new challenges of standards-based education. In data collected by the National Center for Education Statistics (U.S. Department of Education, 1998) the need for more intense professional development related to educational standards was clear. According to this 1998 national survey, although teachers were most likely to participate in professional development activities that focused on reform topics such as standards and assessment, the majority of these activities lasted for only a day, and only 36% of teachers felt very well prepared to implement state or district curriculum and performance standards. Most policy makers and education researchers agree that a critical factor in the success of standards-based reforms is professional development that addresses teachers' needs to teach in new ways that can help all children achieve to high

standards (NCTAF, 1996). In short, standards-based K-12 reforms require that professional development programs adapt to the changing needs of teachers.

For professional development to adequately address teachers' needs, Dougherty and Young (1998) emphasized that the activities need to be aligned with the content standards that are already in place. Based on a survey of 800 teachers by the National Foundation for the Improvement of Education (NIFE), teacher and student growth are supported by opportunities for teacher learning that is closely connected to a school's goals for improvement and to teachers' more immediate needs to implement specific standards in their classroom (Renyi, 1996). To this end, Renyi, executive director of NIFE, urged schools to use student test scores to indicate where students need help and then design teacher professional development programs to address those needs ("State Councils," 1999). Teachers in this study concur with the importance of linking professional development with school improvement as assessed by student achievement: 73% of teachers identified helping students learn as their primary motivation for growing as a professional.

The process for translating this focus on students' test scores into changes needed in instruction, however, is not clear. Grant (2000) summarized studies showing that while an emphasis on test scores influenced teachers to *narrow* the content they teach, it had little effect on *how* they were teaching. In studying the perceptions of teachers in New York state about the state assessments, Grant found that teachers were uncertain about how to use student scores to modify their teaching and uncertain about approaches that might improve student performance. If schools are to meet their goals of helping all students achieve high educational standards, then teachers need professional development that meets their needs by explicitly aligning with standards and providing more specific instructional strategies that target areas of low performance on tests of student achievement.

Linking Standards-Based Professional Development to Teacher and Student Learning

The new level of accountability that accompanies educational standards also can be seen in what is now expected from professional development. States are being urged to fund and support staff development for teachers only if it provides teachers the knowledge and skills to teach to higher standards *and* contributes to improvements in student learning (Sparks & Hirsch, 2000). Sykes (1999) expresses this trend in stating that "first and most obvious, the teacher-student learning connection should serve as a *criterion for selection of professional and school development activity* [italics in original]" (p. 161). The means of establishing this link between professional development and student achievement, however, have proven to be elusive (Guskey, 1997), particularly when it involves the traditional one-day workshops led by outsiders (Wilson & Berne, 1999). As Harwell, D'Amico, Stein, and Gatti (2000) report, very few studies of teacher professional development even attempt to measure effects on student achievement.

One such study describes some large-scale school improvement efforts which resulted in higher student achievement by focusing professional development on those areas which are "proximal" to students (e.g., subject matter, instruction) and by organizing wide-scale teacher implementation (Joyce and Showers, 1995, p. 63). The authors contended that school improvement based only on "distal" factors, such as changing standards and curriculum without teacher training, will not influence student learning. Another study, this one of Community School District #2 in New York City by Resnick and Harwell (1998), also demonstrated the positive effects on student achievement of professional development aimed at standards-based education. In their analysis of student achievement test results, the authors found that in the subject areas where professional development and accountability more clearly reflected the standards (e.g., in literacy), overall student performance was higher than in subject areas less emphasized by professional development (e.g., in mathematics). Finally, in Yoon and Resnick's (1998) study of professional development for middle school mathematics teachers in California, "participation in staff development and the use of 'reform' methods of instruction were positively associated with achievement" (p. 19).

Thus, while there are some studies that have demonstrated the link between standards-based professional development and student learning, it is difficult to draw conclusions as to what exactly accounts for this relationship. Is it the focus on standards? Or simply having a focus on areas of low performance? For example, in another emerging body of research, it appears that the simple fact of narrowing the focus of teaching to a particular subject area (e.g., language arts), or particular skills within a subject area (e.g., reading comprehension) will improve students' scores (Palmer, 1999). Clearly, there is much to learn about what types of professional development promote teacher *and* student learning.

Teacher Access to Quality Professional Development

Although research is accumulating on what features characterize effective professional development and what motivates teachers to participate, teachers' access to such professional development is limited. As indicated in a report on what states are doing to help teachers improve their instruction, most K-12 teachers do not have access to professional development opportunities that can influence both their own learning and that of their students (Hirsch, Koppich & Knapp, 1998). In many school districts, staff development is fragmented and delivered in brief inservice activities. For example, in a 1998 national survey, although 99% of teachers had participated in some form of professional development in the previous 12 months, two out of three teachers reported that the total duration of their involvement was eight hours or less, or the equivalent of a one day workshop (U.S. Department of Education, 1999). Many districts do not have the resources to provide for teacher release time, and instead, rely on a few designated inservice days. Using technology to alleviate this problem by providing online access to professional development anytime, anywhere, is an option being explored by educators at all levels. Although the current research on technology in K-12 education emphasizes teachers' use of technology in the classroom, there is little research on its use as a means of delivering professional development (Marx, Blumenfeld, Krajcik, & Salloway, 1998). Exceptions are studies of the online teacher networks that are becoming more prevalent (e.g., Webber & Robertson, 1998; Taylor et al., 1997). As Putnam and Borko (2000) pointed out, web-based technology has great potential to provide inservice teachers with access to the expertise of others in the field of education. At the same time, technology by itself is not a panacea for increasing teacher knowledge. Teachers will not be motivated to use online technology if they view it as merely an add-on to existing teacher learning activities without additional benefits to their instruction (Schlager, Fusco, & Schank, 1999). The content must be relevant and useful in their professional lives (Marx, et al, 1998). Based on their research, Marx, et. al. recommend that for online professional development to be effective it should incorporate multimedia case studies, scaffolding (e.g., posing of questions to promote teacher reflection), and software designs that model the innovations teachers are learning. The technology to provide online learning already exists and is being used widely in business and increasingly in higher education. As districts serving K-12 populations search for ways to increase teachers' access to quality professional development, they too, are turning to online solutions.

The Professional Development Model

The Learning Bridges professional development model includes an Instructional Intervention Plan (IIP) and a web-delivered professional development program. All teachers in the treatment group will receive the IIP and participate in the professional development component; teachers in the control group will receive neither. Each of these components is described below.

Instructional Intervention Plan (IIP)

At the beginning of the study (fall 2001), schools in the treatment group will receive an Instructional Intervention Plan (IIP) prescribing instructional strategies aligned to target areas of low student performance on the district's grade level benchmarks as indicated by district and state assessments.

The IIP is unique in that it links actual student achievement data with research on effective instructional practices. After examining students' tests scores at each grade level, trained consultants develop an IIP that identifies specific instructional strategies (e.g., concept attainment, advance organizers, etc.) that have been demonstrated to improve student achievement in the area of low performance (e.g., reading comprehension, math computation). Utilizing data about the effects of each instructional strategy on student achievement (i.e., effect size), the IIP provides teachers with a list of the strategies that have demonstrated the *greatest* impact in a particular area of need. The IIP also provides a bibliography on the relevant teaching practices, general information regarding instruction (e.g., brain research, multiple intelligences), and recommendations for professional development.

The development of an IIP that links student achievement data with educational standards and research on effective instruction is facilitated by a database developed by Learning Bridges (2000), a professional development company created by and for educators. The Learning Bridges Aligned Instructional Database (2000) links specific teaching practices to state standards in mathematics and language arts based on research on the effects of these practices on student performance (Darling, personal communication, July 21, 2000). These instructional practices were identified on the basis of studies that reported the effect sizes associated with changes in student performance. The first step in developing this database was to link content standards from individual states to the McREL Compendium of Standards (Kendall & Marzano, 1997) using another database developed by McREL for Achieve Communications (2000). Then, a team of nine content and instructional specialists, all with advanced degrees in education and an average of 25 years of experience in the field, analyzed the research and mapped the 25 most effective teaching practices to each of the content standards in language arts and mathematics based on the type of knowledge being assessed and the way in which the brain would process this information. The team also linked each of the teaching strategies to the instructional frameworks of Joyce, Weil, and Calhoun (2000) and Marzano (1998). The final result was a map of the links between effective instructional strategies, student achievement, and individual state standards that could be used to make specific recommendations for improving student performance through changes in teacher practices at each grade level.

Online Professional Development Modules

In addition to receiving the IIP, teachers from schools assigned to the treatment group also will participate in a two-year project that includes the completion of four web-delivered professional development modules developed by Learning Bridges to teach the specific, standards-based instructional strategies recommended in the plan. Each module offers a structured environment for learning a single instructional strategy, has context and examples related to both language arts and mathematics, and comes in elementary and secondary versions. The developers of the modules report that it takes about 8 to 10 hours to complete all of the course activities, which are scheduled over a two-week period. For the proposed study, teachers will be required to select four different modules from the top 25 instructional practices (i.e., 25 highest effect sizes) recommended by the IIP for their school and grade level. Teachers must begin their first module within the first four weeks of the school year and complete two modules each academic year.

Although web-delivered, the modules include offline as well as online components. Online features include tutorials on the particular instructional strategy, pre/post-tests of teachers' declarative knowledge of the instructional strategy being presented, learning activities that require teachers to develop lesson plans targeted to the strategy being learned, and online discussions with other participating teachers and the course instructor. Offline, teachers are required to try out their new instructional strategies in their own classrooms before returning to the online course to share and reflect upon what they have learned. Teachers receive a Course Proficiency Score at the end of the course representing their procedural knowledge of the targeted instructional strategy and also complete an online evaluation of the course. The

University of California at Bakersfield will provide accreditation for the modules and one hour of graduate credit for each module, provided that teachers fulfill the course requirements and wish to pay the tuition.

Evaluation Design

This evaluation includes both formative and summative components in examining the quality, utility, and impact of the Learning Bridges standards-based professional development model. Formative data will be gathered to document the implementation process. Summative data collection will focus on the impact of this professional development model on teacher and student learning. This aspect of the evaluation will employ a quasi-experimental design (i.e., treatment and control groups) in examining the impact of participation in the Learning Bridges professional development program.

Guiding Evaluation Questions

This evaluation is guided by three key questions, one formative and two summative:

1. How was the Learning Bridges standards-based professional development model *implemented*? (formative)
 - a. What is the context in which the professional development takes place and for teachers as they put what they are learning into practice?
 - b. What is the nature of the treatment (e.g., quality, intensity and duration of participation)?
 - c. Which features of the Learning Bridges standards-based professional development model have been identified as most effective in promoting the desired outcomes around improved teaching and learning?
2. To what extent is participation in the Learning Bridges standards-based professional development model related to changes in *teacher knowledge and skills*? (summative)
3. To what extent is participation in the Learning Bridges standards-based professional development model related to higher levels of *student achievement*? (summative)

Sample

The sample for this evaluation will include four urban elementary schools—two in the treatment and two in the control group—and approximately 150 teachers and 2000 students. Control schools will be selected on the basis of matching characteristics (e.g., percent minority, percent eligible for free and reduced price lunch, percent English Language Learners, and student achievement).

Data Collection Procedures and Measures

Summative data on teacher knowledge/skills, and instructional practices and student achievement will be tracked over time at the treatment and control schools including baseline assessments in the fall of 2001 and follow-up in the spring of 2002 and 2003. Formative data on the context, nature, and effectiveness of the professional development model will be collected annually at the treatment sites. To reduce attrition of participants over the course of the two-year study, teachers at the control sites will receive honorariums for completing each stage of the data collection. See Table 1 for a summary of measures and data sources.

Table 1: Key measures and data sources.				
Key Measures	Populations		Main Data Source	Validation Data Source ¹
<i>Student-level</i>	Experimental	Control		
Student socioeconomic status (SES)	X	X	Student database	
Student race	X	X	Student database	
Student achievement	X	X	Student database	
<i>Teacher-level data</i>				
Teacher preparedness	X	X	Teacher survey	Declarative knowledge post-test
Years of teaching subject area	X	X	Teacher survey	
Prior use of targeted instr. strategies	X	X	Teacher survey	
Prior PD on targeted instr. strategies	X	X	Teacher survey	
Other PD	X	X	Teacher survey	
Attitudes toward and prior use of technology	X		Teacher survey	
Supportive conditions				
Teacher reflection	X	X	Teacher survey	Course Projects & online evaluation
Teacher collaboration (professional community)	X	X	Teacher survey	Online records
Alignment of PD to classroom	X	X	Teacher survey	Nature of PD course assignments
Other support for implementation	X	X	Teacher survey	
Dosage (PD participation)	X	X	Project records	
Fidelity of implementation	X	X	Instructional strategies report	
Use of targeted instructional practices (appropriate use/fidelity and intensity of use)	X	X	Instructional strategies report	Proficiency score
Perceptions of PD effectiveness				
<i>School-level data</i>				
School SES	X	X	State database	
School size	X	X	State database	
Grade level	X	X	State database	

¹ All validation sources are components of the intervention (i.e., the professional development course).

Summative Data

Teacher-level data collection. Several data sources will be used for collecting and validating data at the teacher-level. The primary data sources for both the experimental and control groups include: (1) an *Instructional Content and Strategies Report*, (2) a teacher survey, and (3) sampling records. Data from the professional development course will be used for validation of measures.

The two key variables for monitoring teachers' instructional practices are *teachers' use of the targeted instructional strategies (TIS)* and *content coverage*. The measure of *TIS use* is a composite variable that includes both "appropriate use" of the selected instructional strategies, as assessed by the fidelity of implementation, and the "intensity of use" in each subject area. *Content coverage* is a measure of the breadth of material addressed during the implementation and is intended to assess the extent to which teachers narrow their focus on particular content areas. For both measures, baseline data will be collected at the beginning of the evaluation (fall 2001) with post-data being gathered at the end of each year (spring 2002, spring 2003) via an Instructional Content and Strategies Report (ICSR) that is embedded into the teacher survey. The ICSR asks teachers to note which of the 25 TIS they used during the school year, how often, and for how long. It also asks teachers to report on the nature of TIS use to assess the fidelity with which these strategies were implemented in the classroom. The ICSR also asks about the breadth of content covered during that same period of time.

Validation of the fidelity component of *teachers' use of the targeted instructional strategies* will occur through comparison to the proficiency score that teachers receive as part of the professional development course. This overall Course Proficiency Score assesses participants' procedural knowledge and is assigned by the course instructor. The rubric to assess teachers' Course Proficiency Score is the basis of four criteria: (1) appropriate use of the TIS in the classroom, (2) quality of teachers' TIS lesson plans, (3) teachers' ability to be reflective as noted in their project write-ups, and (4) teachers' grasp of the TIS as noted by the feedback they provide to others in the online discussions. Validation of the intensity of use and *content coverage* will come via parallel measures on the self-report teacher survey.

A self-administered *teacher survey* given at the beginning of the evaluation and end of each year (fall 2001, spring 2002; fall 2002, spring 2003) will provide data on *teacher demographics* (gender, race, grade level), *teacher preparedness* (years of teaching this subject area, knowledge, prior use of, and professional development on the targeted instructional strategies, other professional development), *context of the implementation* (school climate, subject area, grade level, course structure), and *conditions that support effective implementation* of the targeted instructional strategies (teacher reflection, teacher collaboration, connection of the professional development process to the classroom, links to teachers' instructional and school improvement goals, administrator support, teacher beliefs about student learning, teacher efficacy related to standards, teacher ratings of subject area knowledge). The teacher survey also will include alternative measures to validate the indicators of *teachers' use of TIS* and *content coverage* gathered via the ICSR. Validation of *teacher preparedness* measures comes from a review of teachers' scores on the online course's Declarative Knowledge Test, which assesses their grasp of key concepts and vocabulary. Validation of supportive conditions comes from data collected as part of the online course assignments (*connection to the classroom*), teacher projects and course evaluation (*teacher reflection*), and records of participation in online discussions (*teacher collaboration*). Additional survey data to be collected from teachers in the treatment group includes: prior use of and proficiency in using technology, attitudes towards technology (*preparedness*); actual time spent on each professional development module (*dosage*), and teachers' perceptions of the effectiveness of the professional development course (*effectiveness*).

Teacher focus groups will be conducted annually in the spring to obtain feedback from participating teachers on the effectiveness of the Learning Bridges professional development model. Teachers' level of

participation in the professional development model, or *dosage*, will also be tracked via project records and validated by the teacher survey. *Dosage* will be measured in the number of modules completed; for the control group the dosage will be zero, and for the treatment group up to four modules.

Student-level data collection. The school districts involved in this evaluation maintain a database of student information by grade level and school. This database will be the source of data for the key student-level measures: *student socioeconomic status (SES)* (eligibility for free or reduced price lunch), *student race* (five major categories), and *student achievement*.

Measures of student achievement will come from the state's two assessments; both of which are aligned with the state standards (see Table 2, next page). Proficiency scores from the reading and mathematics portions of the Minnesota Comprehensive Assessment (MCAs), administered in grades 3 and 5, and the Minnesota Basic Skills test, administered in grade 8, will be used to measure changes in student achievement over the course of the project. In addition, changes in student achievement on nationally-normed, standardized tests (the Northwest test in Minneapolis and the Metropolitan Achievement Test, Version Seven (MAT7) in Saint Paul) will also be examined. Although not aligned with the state standards, student performance on these tests is an important indicator of student learning. Normal Curve Equivalent (NCE) scores for language arts and math, and, if necessary, NCE scores for subtests (e.g., vocabulary, reading comprehension, math procedures, etc.) will be used for the analyses of student achievement on the standardized tests. NCE scores are normalized standardized scores with a fixed relationship to percentile ranks and equal intervals. The standardized nature of NCEs allows for comparisons across different tests and subject areas, and is particularly appropriate for use in multivariate analyses.

Baseline data from both the state assessments and the nationally-normed, standardized achievement tests for the treatment and control school will be extracted from these databases in the spring of 2001 with follow-up data being extracted in the spring of 2002 and 2003.

Project-Level Data. The evaluation design also includes the collection of data regarding the implementation of the Learning Bridges professional development model. Such data will include information on the context of implementation, the nature of the professional development model, and its effectiveness in bringing about the desired improvements in teaching and learning. Data to be analyzed in this regard includes school characteristics (e.g., percent minority, percent eligible for free or reduced price lunch), teacher quality (e.g., years of teaching, teacher certification) and school support for implementation, level of participation in the Learning Bridges professional development program, participation in other professional development, the nature of all professional development (e.g., quality, intensity, duration), and teacher perceptions of the program effectiveness. School-level data will be gathered annually from school records. Data on the nature of the Learning Bridges professional development program and teacher participation will be collected from annual program records. All other data on teacher quality, school support for implementation, and participation in other forms of professional development will be gathered via the teacher survey described above. Teacher perceptions of program effectiveness will be gathered by the annual focus groups also describe above.

Table 2: Sources of Student Achievement Data					
	Treatment				Control
	Minneapolis Public Schools				Saint Paul Public Schools
Grade Level	Anderson Open (K-8)		Bryn Mawr (K-5)		Schools (TBD)
	Number students 2001	Tests administered*	Number students 2001	Tests administered*	Tests administered*
PK	11		29		
K	95		111		
1	81		76		
2	89	Northwest	75	Northwest	MAT7
3	78	Northwest MCA	88	Northwest MCA	MAT7 MCA
4	67	Northwest	80	Northwest	MAT7
5	59	Northwest MCA	74	Northwest MCA	MAT7 MCA
6	75	Northwest	--	na	MAT7
7	71	Northwest	--	na	MAT7
8	72		--	na	MAT7
		BST			BST
PK-5, 8	698		533		
K-5, 8	687		504		
2-5, 8	606		393		
* tests administered in the spring (March/April)					

Analytical Strategy

Formative Evaluation

1. How was the Learning Bridges standards-based professional development model *implemented*?
 - a. What is the *context* in which the professional development takes place and into which teachers put what they are learning into practice?
 - b. What is the *nature* of the treatment (e.g., quality, intensity, duration)?
 - c. Which features of the Learning Bridges standards-based professional development model have been identified as most *effective* in promoting the desired outcomes around improved teaching and learning?

Data analysis for the formative evaluation will be descriptive in nature resulting in narrative descriptions of the context, nature of the intervention, and effective features.

Summative Evaluation

2. To what extent is participation in the Learning Bridges standards-based professional development model related to changes in *teacher knowledge and skills*?
3. To what extent is participation in the Learning Bridges standards-based professional development model related to higher levels of *student achievement*?

Prior to conducting the primary analyses to examine the impact of participation in the Learning Bridges professional development model on teacher knowledge/skills and student achievement, sampling and context data will be used to verify the comparability of the treatment and control sites.

The primary analyses of impact on teacher knowledge and skills will examine differences between treatment and control groups. This will involve a statistical comparison of the change in teacher knowledge and skills in treatment and control sites using analysis of covariance to control for level of participation (*dosage*), *teacher preparedness* and *school support* for the implementation. Secondary analyses will explore other factors that might be correlated with differences in teacher knowledge and skills.

The primary analysis of impact on student performance will examine differences between treatment and control groups. This will involve a statistical comparison of changes in student performance over time in treatment and control sites using analysis of covariance to control for level of participation (*dosage*). These analyses will be conducted using the reading and mathematics portions of the MCAs for grades 3 and 5, the BST at grade 8, and each district's standardized achievement test for the grades in which they are administered (typically grades 2-8). Secondary analyses will explore other factors that might be correlated with differences in student performance.

Deliverables

All evaluation briefs and annual reports will be distributed to participants *at the conclusion* of the project, so as not to influence the results.

- Two Formative Evaluation Briefs (formative data and baseline summative) – January 1, 2001; January 1, 2002
- Two Annual Evaluation Reports (summative and formative data) – August 1, 2002; August 1, 2003
- Presentation of annual evaluation results to school staff – September 2003

Tasks and Timelines

Fall 2001

- Identify key contacts at treatment schools (August)
- Select control schools (August)
- Design teacher survey and (August-September)
- Revise Instructional Strategies and Content Report (August-September)
- Meet with contacts at each school and administer baseline teacher survey and baseline ISCR to teachers at treatment and control schools (September-October)
- Enter teacher survey and ISCR data (October)
- Analyze teacher survey and ISCR (October-November)
- Conduct focus groups with teachers in treatment group (December)
- Transcribe focus group data (December)
- Analyze focus group data (December)

Winter 2002

- Write Formative Evaluation Brief #1 detailing results of focus group and baseline data from teacher survey
- Submit Formative Evaluation Brief #1 (January 1)
- Set up process for obtaining student demographic and achievement data from schools

Spring 2002

- Administer follow-up teacher survey and ISCR to all teachers at treatment and control schools (May)
- Enter teacher survey and ISCR data (May)
- Conduct focus groups with teachers in treatment group (May)
- Transcribe focus group data (May)
- Obtain student data from schools (May)

Summer 2002

- Analyze teacher survey and ISCR (June)
- Analyze focus group data (June)
- Prepare and analyze student performance data (June-July)
- Write Annual Evaluation Report #1 detailing formative and summative results
- Submit Annual Evaluation Report #1 (August 1)
-

Fall 2002

- Administer baseline teacher survey and baseline ISCR to *new* teachers at treatment and control schools (September)
- Enter teacher survey and ISCR from *new* teachers (September)
- Analyze teacher survey and ISCR from *teachers new to the project* (October-November)
- Conduct focus groups with teachers in treatment group (December)
- Transcribe focus group data (December)
- Analyze focus group data (December)

Winter 2003

- Write Formative Evaluation Brief #2 detailing results of focus group and baseline data from teacher survey
- Submit Formative Evaluation Brief #2 (January 1)
- Review process for obtaining student demographic and achievement data from schools

Spring 2003

- Administer follow-up teacher survey and ISCR to all teachers at treatment and control schools (May)
- Enter teacher survey and ISCR data (May)
- Conduct focus groups with teachers in treatment group (May)
- Transcribe focus group data (May)
- Obtain student data from schools (May)

Summer 2003

- Analyze teacher survey and ISCR (June)
- Analyze focus group data (June)
- Prepare and analyze student performance data (June-July)
- Write Annual Evaluation report detailing formative and summative results
- Submit Annual Evaluation report (August 1)

Fall 2003

- Present results to treatment and control schools (September)

Organizational Capacity and Staff

The Mid-continent Laboratory (MCL) and the Mid-continent Research for Education and Learning (McREL)

Mid-continent Laboratory (MCL) is a wholly-owned, for-profit subsidiary of McREL with full access to McREL resources. McREL is a nonprofit organization established to improve the quality of education through the application of the best available knowledge from research, development, and experience. Since it was founded in 1966 it has been a service-oriented, client-driven organization that focuses on conducting research, disseminating information, and providing technical assistance to state and local agencies and K-12 schools in its seven state region of Colorado, Kansas, Missouri, Nebraska, North Dakota, South Dakota, and Wyoming. Its mission is to work with education leaders and educators in designing and implementing innovative educational strategies and systems that meet the needs of our ever-changing society. McREL focuses its programmatic efforts around curriculum, learning and instruction; rural and small schools; science and mathematics; evaluation; and, applied research.

McREL is part of a national network of educational laboratories and centers, funded by the Office of Educational Research and Improvement of the U.S. Department of Education, working on the cutting edge of educational programs and services. Research and evaluation have been central to McREL's work since its inception.

McREL's core staff of 70 professionals includes nationally recognized leaders in education, research, and related fields. The Laboratory's main offices, located in Aurora, Colorado, maintain extensive computer technology, communication and production capabilities, and information resources for supporting staff

work. Additional information regarding McREL is available through our home page on the World Wide Web at <http://www.mcrel.org>.

Qualifications of Key Staff

The staff for this evaluation include:

- Elisabeth Palmer, Principal Evaluator
- Judy Northrup, Evaluator
- Dawn Fries, Evaluation Assistant

Qualifications of senior staff include (see attached vita):

Project Director, Elisabeth A. Palmer, Ph.D., is a Principal Evaluator at McREL. Dr. Palmer earned a Ph.D. in Sociology from the University of Minnesota. For the past 10 years she has conducted and disseminated educational research, policy, and program evaluations at the local, state, national and international level. Dr. Palmer was a researcher with the 1992 U. S. IEA Computers in Education Study and has conducted numerous studies of educational technology, teacher professional development, and student assessment. Her particular skills involve designing and managing studies involving multiple methods and sites, survey research, and advanced statistical analyses. Dr. Palmer will design and direct the study.

Judy Northrup will manage the data collection, assist with data analysis and reporting. Dawn Fries will assist with data entry, analysis, and reporting. Robyn Alsop will coordinate consultant agreements with teachers at control sites.

Year 1 (FY 2001-2002) Staffing days:	Palmer 28, Northrup 16, Fries 16; Alsop 2
Year 2 (FY 2002-2003) Staffing days:	Palmer 37, Northrup 23, Fries 34; Alsop 4
Year 3 (FY 2003) Staffing days:	Palmer 32, Northrup 25, Fries 30; Alsop 4

ATTACHMENT 8

BRYN MAWR ELEMENTARY SCHOOL

Barbara Braaten, Principal

MINNEAPOLIS PUBLIC SCHOOLS

Dr. Carol ...
ndent

#3

INSTRUCTIONAL INTERVENTION PLAN

September 10, 2001

Confidential Information

Background Information

Bryn Mawr Elementary School, a K – 5 school, has 55 teachers. The principal, Barbara Braaten, has empowered teachers to address school improvement issues, and supports change efforts through her leadership and vision. Bryn Mawr Elementary School has 6 classroom teachers and 4 specialists that are new to the teaching profession (1 – 3 years of experience). They have 45 experienced teachers with more than 3 years of experience. Seventy-seven percent (77%) of the students are eligible for free or reduced lunch indicating a low socio-economic status. Eighty-five percent (85%) of the students are from minority groups with 43% of the student considered ELL (English Language Learners). This presents a unique challenge to Bryn Mawr teachers, especially in the area of reading. In addition, 28% of the students do not complete a full year at the school, and therefore, do not benefit from the consistent delivery of services and academic programs at Bryn Mawr. In spite of this, efforts by the school to encourage daily attendance are extremely successful with 75% of the students attending 95% of the time or better.

Bryn Mawr Elementary School uses a several delivery models to provide appropriate instruction to its students. Included are self-contained classrooms, grade level teams, looping practices, and collaborative teams. The Minneapolis Public Schools District has standards at each grade level which are correlated to the State Standards and Grade Level Benchmarks. Bryn Mawr utilizes a Houghton-Mifflin Reading Program, supplemented by Accelerated Reader. Everyday Math is used in mathematics instruction, supplemented by Accelerated Math. The John Collins Writing program is used for written language instruction. School improvement efforts are focused on reading, writing, and mathematics with the implementation of John Collins' writing strategies, and the Accelerated Reader and Accelerated Math programs. During the past two years, professional development for teachers has been centered on implementing Ruby Payne strategies because of the unique demographic characteristics of the Bryn Mawr student population. Teachers have also been involved in mapping their curriculum to state standards, and in learning how to implement the John Collins writing program. Seven to eight days are built in to the 2001-02 school calendar for Professional Development at Bryn Mawr Elementary School. Barbara Braaten, the school principal also supports personal learning activities of her teachers, such as workshops and classes.

TARGETED STANDARDS

Students make exceptional gains in mathematics during the past year – an accomplishment about which administrators, teachers, parents, and students should be extremely proud. The administrators and teachers have identified the following language arts grade level standards as areas in need of improvement based on the Minnesota Comprehensive Assessment for grades 3 and 5, the NALT given in grades 2 – 5, the STAR Reading and Math, and the Oral Reading Assessment given in grades 1 – 2. Bryn Mawr Elementary School has been identified as Low Performing in the area of reading only based on reading scores. As such, they have selected the K – 3 and 4 – 5 language arts benchmarks on which to focus their efforts for the 2001-02 school year. They will improve academic achievement by delivering effective, standards-based instruction in the targeted language arts benchmarks.

LANGUAGE ARTS

Standard 1: Read, Listen, and View

Literal Comprehension

A student shall demonstrate comprehension of literal meaning through reading, viewing, and listening to nonfiction and fiction selections by:

1. **K – 3** – Identifying main ideas and some supporting details
2. **K – 3** - Retelling main events or ideas in sequence
3. **K – 3** - Pronouncing new words using phonic skills
4. **K – 3** – Reading aloud fluently with appropriate expression.
5. **K – 3** – Demonstrating appropriate techniques for learning new vocabulary
6. **K – 3** - Interpreting presentations of data

Interpretation and Evaluation

A student shall interpret and evaluate information from age-appropriate nonfiction and fiction selections by reading, viewing, and listening to:

1. **K – 3** - Understand ideas not explicitly stated
2. **K – 3** – Make predictions based on information in the selection
3. **K – 3** – Draw conclusions based on information in the selection
4. **K – 3** – Compare and contrast elements of the story or selection
5. **K – 3** – Distinguish facts from opinions
6. **K – 3** – Summarize ideas and identify tone in persuasive, fictional, and documentary presentation.

Literal Comprehension

A student shall demonstrate comprehension of literal meaning by:

1. **4 – 5** – Reading, listening, and viewing of nonfiction and fiction selections identify main ideas and support details, retell main events or ideas in sequence, pronounce new words using phonics, demonstrate techniques of improving and expanding vocabulary, and demonstrate an age-appropriate reading rate.
2. **4 – 5** – Reading and applying technical instructions to perform an action
3. **4 – 5** - Using presentations of data to understand scientific or mathematical information
4. **4 – 5** - Summarizing ideas and information from visual presentations

Interpretation and Evaluation

A student shall interpret and evaluation information from age-appropriate nonfiction and fiction selections by reading, listening, and viewing to:

1. **4 – 5** – Distinguish fact from opinion in nonfiction selections
2. **4 – 5** – Interpret figurative language
3. **4 – 5** – Make predictions based on information in the selection
4. **4 – 5** – Compare and contrast settings, ideas, or actions
5. **4 – 5** – Understand ideas not states explicitly in the selection

6. 4 – 5 – Interpret effects of persuasive visual messages

To improve student achievement of the targeted state standards, Bryn Mawr Elementary School has requested Learning Bridges to provide a customized Instructional Intervention Plan (IIP) for the above grade level benchmarks.

Instructional Intervention Plan (IIP)

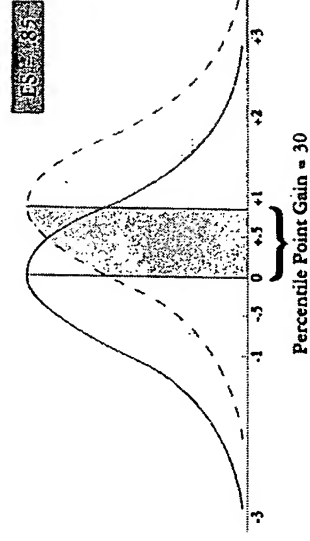
The Instructional Intervention Plan is drawn from the Learning Bridges Aligned Instructional Database© containing 12,500 teaching practices aligned to the benchmark standards in language arts and mathematics of 49 states. The teaching practices are drawn from 30,000+ research studies represented in numerous meta-analyses of research on instruction that yield an Effect Size to measure the impact on academic achievement. All teaching practices reflect brain compatibility and compatibility with identified intelligences. All teaching practices are responsive to the type of knowledge being asked by the benchmark standard (e.g., declarative, procedural) as well as the way the brain processes the knowledge.

Impact on Learning

Each identified state benchmark in language arts and/or mathematics has the top 24 teaching practices mapped to it that will make the most difference in learning. The teaching practices are ranked for their effectiveness, or impact on learning, by their Effect Size and by professional judgment of content and instructional specialists.

What is an Effect Size? The difference between an experimental and control group on the dependent measure into a standardized metric is referred to as an "effect size" (Glass, 1976, 1978; Glass & Smith, 1979; Glass, McGraw & Smith, 1981). It is the gain score. The advantage is that effect sizes can be compared across students that use different dependent measures. Marzano (1998) states that the effect size metric is useful because "it is standard deviation units and can, therefore, be interpreted as a change in the percentile ranking of the 'average' subject in the experimental group."

Figure 1.3
Depiction of Effect Size



No teaching practices with a Low Impact on Learning were included in the Learning Bridges Aligned Database©. Only teaching practices with Moderate, High, or Superior Impact on Learning were included.

Effect Size Ranges

Impact on Learning	Effect Size Range	Maximum Gain in Percentile Points	Rationale
Low	.01 - .40	0 - 16 points	At best, low effect size teaching practices will take learning to the 66 th percentile - way below mastery.
Moderate	.41 - .80	17 - 29 points	At best, moderate effect size teaching practices will take learning to the 79 th percentile – right below mastery.
High	.81 – 1.3	30 – 40 points	At best, high effect size teaching practices will take learning to the 90 th percentile – significantly above mastery.
Superior	1.3+	41 – 49 points	At best, superior teaching practices will take learning to the 99 th percentile – usually considered superior in grading, too.

Teaching Practice Information Provided

For each teaching practice aligned to the targeted (tabbed) benchmarks, the following information is provided:

1. **Impact on Learning** – Moderate, High, Superior
2. **Definition of the Teaching Practice** – what the teaching practice is
3. **What the Teaching Practice will Enable LEARNERS to do with THIS Benchmark Standard** – bulleted list
4. **Role of the Teacher** – bulleted list. (Note: This does not tell “how to” do the teaching practice. The “how to” for planning, implementing, refining, and evaluating a teaching practice is provided in the Learning Bridges classes.)
5. **Connections to Brain Research and Multiple Intelligences** – connections between known and new
6. **Instructional Framework** – Connections to Joyce and Weil’s Framework of Instruction as well as Marzano’s Knowledge and Processing Systems.

Other Variables That Impact Academic Achievement

Learning Bridges recognizes that there are other variables that impact academic achievement. Effective Schools Research addresses these variables that impact academic achievement.

1. Clear purpose and vision
2. Climate conducive to learning
3. Effective leadership
4. Site-based management
5. District level support
6. Collaborative planning
7. Curriculum articulation and alignment
8. Parental involvement
9. Classroom management
10. High expectations
11. Flexible grouping of students
12. Assessment, monitoring, and feedback
13. Strong staff development program
14. Instructional preparation
15. Instructional delivery

The Learning Bridges Instructional Intervention Plan and teacher training modules have a powerful impact on many of them.

STANDARD

Read, View,

K – 2 BENCHMARK

Dictates or writes detailed descriptions of familiar persons, places, objects, or experiences

TEACHING PRACTICES

Teaching Pattern and Organization – Superior

Vocabulary Action Pictures – Superior

Activating Prior Knowledge – Superior

Synectics – Superior

Semantic Representation of Vocabulary – Definition/Description - Superior

Contextual Vocabulary – Superior

Shared Learning – Superior

Compare and Contrast – Superior

Metacognitive Strategies for Writing/Reading – High

Journaling – High

Cues and Feedback – High

Character Quotations – High

Writing Process – Primary Traits – High

Cognitive Strategies for the Writing Process – High

Verbal Linguistic Vocabulary Building – High

Descriptive Writing – Moderate

Promoting Classroom Discourse – High

Effective Praise for Student Achievement – High

Student Focused Learning – High

Instructional Conversation – High

Writing Descriptive Poems Using Photographs – Moderate

Storytelling/Story Writing/Story Reading – Moderate

Creative Dramatics in Language Arts – Moderate

Primary Sources – Moderate

Discourse Characteristics – Moderate

Teaching Pattern and Organization

Superior

What the Teaching Practice Accomplishes With THIS Standard	Role of the Teacher
<p>Teaching Pattern and Organization is a method that is a key to improving reading comprehension because it uses visual organizers, discussion, and concrete examples to help students see the pattern or direction that an author is taking.</p> <p>Teaching Pattern and Organization will enable learners to:</p> <ul style="list-style-type: none"> • Demonstrate an understanding of an author's pattern and story concepts. • Provide examples of story concepts and words that describe them. • Draw a simple diagram to create a mental scheme for the text as well as the detailed descriptors used for persons, places, objects, or experiences. • Engage in discussions and predictions at various intervals in the story. • Create visual images of what is being said and identify words that help to create the visual images. • Build concrete examples of the story concept (e.g., pictures, physical actions, demonstrations). 	<p>When using Teaching Pattern and Organization, the teacher will:</p> <ul style="list-style-type: none"> • Develop lessons that assist students in "seeing the plan" (patterns and story organization). • Model and explicitly teach specific strategies related to concept building (e.g., drawing diagrams, identifying critical attributes, creating visual images, and building story concepts). • Provide opportunities for controlled, guided, and independent practice in representing the story organization, concepts, and the descriptors used. • Ask open-ended questions throughout the reading process to develop metacognitive processes within students. • Provide acknowledgement and oral feedback as students strive to develop strategies of patterning and organization during the reading process.
Connections to Brain Research & Multiple Intelligence Theory	Instructional Framework
<p>The use of Teaching Pattern and Organization is supported by:</p> <ul style="list-style-type: none"> • Brain-based Research - Dual Encoding, Construction of Knowledge, and Metacognition. • Multiple Intelligences: Intrapersonal, Interpersonal, Verbal/Linguistic, and Visual/Spatial. 	<ul style="list-style-type: none"> • Cognitive System Information Processing/Idea Representation/Metacognitive System Process Monitoring • Information Processing Model - Interactive, Indirect, Independent

Vocabulary Action Pictures

Superior

What the Teaching Practice Accomplishes With THIS Standard	Role of the Teacher
<p>Vocabulary Action Pictures is an effective strategy for unifying new words with their meanings through the use of creative illustrations.</p> <p>Vocabulary Action Pictures will enable learners to:</p> <ul style="list-style-type: none"> Learn definitions through a visual and kinesthetic mode in addition to the traditional verbal/linguistic process to add vocabulary used to describe familiar persons, places, objects, or experiences. Design action pictures that symbolize the word itself along with the definition (e.g., a student might draw "semantic" as a sea man with ticks on his face and holding up a long list of words and definitions). Transfer words and meanings into long-term memory because of dual encoding, student involvement, and motivation. 	<p>When using Vocabulary Action Pictures, the teacher will:</p> <ul style="list-style-type: none"> Facilitate and aid vocabulary meanings by allowing students to use the visual and kinesthetic styles of learning in addition to the verbal/linguistic style. Model examples of creating Vocabulary Action Pictures for the whole class. Include vocabulary words that are specific to current class content in order to create deeper meaning within students. Encourage students to share their vocabulary illustrations as a reinforcement technique.
Connections to Brain Research & Multiple Intelligence Theory	Instructional Framework
<p>The use of Vocabulary Action Pictures is supported by:</p> <ul style="list-style-type: none"> Multiple Intelligences: Visual/Spatial, Bodily/Kinesthetic, and Verbal/Linguistic. Brain-based Research – Transfer Bridging, Dual Encoding, Motivation, Reinforcement, and Meaningful Learning. 	<ul style="list-style-type: none"> Cognitive System Information Processing/ Knowledge/Informational Domain/Idea Representation/Metacognitive System Information Processing, Personal, Models - Indirect

Activating Prior Knowledge

Superior

What the Teaching Practice Accomplishes With THIS Standard	Role of the Teacher
<p>Activating Prior Knowledge uses storage and retrieval procedures (such as Anticipation Guides and KWL Plus) delivered at the beginning of a lesson and designed to elicit preconceived ideas, retrieve known knowledge, and provide a focus for the new information.</p> <p>Activating Prior Knowledge will enable learners to:</p> <ul style="list-style-type: none"> • Activate and build on their prior knowledge and natural curiosity to learn more • Dictate or write more detailed descriptions of familiar persons, places, objects, or experiences based on the prompts that activate prior knowledge and experience. • Utilize concept maps, graphic outlines, and advance organizers to record the results of retrieved, descriptive information. • Focus on the new learning and its connection to the known. 	<p>When using Activating Prior Knowledge, the teacher will:</p> <ul style="list-style-type: none"> • Identify the concepts that students will encounter in the descriptive writing task. • Prepare non-linguistic organizers for specific purposes (i.e., colorful modifiers to make the picture clearer, adverbs to add to the action, using the five senses). • Guide students in summarizing retrieved knowledge. • Assist students in representing the connections between the new and known information in a non-linguistic representation.
Connections to Brain Research & Multiple Intelligence Theory	Instructional Framework
<p>The use of Activating Prior Knowledge is supported by:</p> <ul style="list-style-type: none"> • Brain Research - Activation of Prior Knowledge, Storage and Retrieval, Patterning, and Connecting of New to Known Information. • Multiple Intelligences: Visual/Spatial, Logical/Mathematical, and Intrapersonal. 	<ul style="list-style-type: none"> • Knowledge System/Cognitive Instructional Strategy/Storage and Retrieval • Information Processing, Behavioral, Social, Personal Models – Direct, Indirect

Synectics

Superior

What the Teaching Practice Accomplishes With THIS Standard	Role of the Teacher
<p>Synectics is a strategy that uses metaphors and analogies to create something new or to make the strange familiar, thereby producing new and creative ways of thinking about ideas and concepts.</p> <p>Synectics will enable learners to:</p> <ul style="list-style-type: none"> • Connect the familiar with the unfamiliar and to create a new idea from a familiar idea with the use of metaphoric activity. • Use Personal Analogy, Direct Analogy, and Compressed Conflict to create a new idea for descriptive writing. • Enhance personal flexibility and creativity, particularly the ability to think divergently. • Write more creative descriptions of familiar persons, places, objects, or experiences. 	<p>When using Synectics, the teacher will:</p> <ul style="list-style-type: none"> • Identify the problem, situation, or topic for description. • Guide students through the steps of the operational mechanisms, including the use of Personal Analogy, Direct Analogy, and Compressed Conflict to create new ways of describing persons, places, objects, or experiences. • Provide feedback to students so they can explore more creative analogies during the process. • Control responses to keep students from pushing to a comparison too soon and to guard against premature analyses. • Provide opportunities for students' self-reflection on their mental processes.
Connections to Brain Research & Multiple Intelligence Theory	Instructional Framework
<p>The use of Synectics is supported by:</p> <ul style="list-style-type: none"> • Brain Research - Construction of Knowledge, Information Processing, Metacognition, Activation of Prior Knowledge, Patterning, and Connecting the New to Known. • Multiple Intelligences: Verbal/Linguistic, Logical/Mathematical, Interpersonal, Intrapersonal, and Visual/Spatial. 	<ul style="list-style-type: none"> • Knowledge System, Cognitive Strategy/ Informational Domain/Idea Representation/Information Processing • Metacognitive System Process Specification and Process Monitoring (understanding and analysis) • Information Processing Model - Indirect

STANDARD

Demonstrates competence in the general skills and strategies of the writing process.

3 - 5 BENCHMARK

Writes narrative accounts (e.g., engages the reader by establishes a context and otherwise developing reader interest; establishes a situation, plot, point of view, setting, and conflict; creates an organizational structure that balances and unifies all narrative aspects of the story; uses sensory details and concrete language to develop plot and character; uses a range of strategies such as dialogue and tension or suspense).

TEACHING PRACTICES

Strategic Reading and Writing – Superior
Reading and Writing for Meaning – Superior
Steps in Processing Literature – Superior
Collaborative Concept Mapping – Superior
Rehearsal of Learning – Superior
Graphic Representations/Organizers – Superior
Critical Thinking Skills – Superior
Concept Attainment – Superior
 Synectics - Superior
Writing Process – Primary Traits – High
 Teaching Heuristics – High
Cognitive Strategies for the Writing Process – High
 Character Quotations – High
 Writing for an Audience – High
 Patterning – High
Deductive Reasoning for Organizing Ideas – High
 Summarizing – High
 Role Playing – High
 Teaching for Relevancy – High
 Model Making – High
Specific Feedback on Strategy Use – High
Differentiated Instruction – High
 Descriptive Writing – Moderate
Storytelling/Story Writing/Story Reading – Moderate
Effective Questioning Techniques – Moderate

Strategic Reading and Writing

Superior

What the Teaching Practice Accomplishes With THIS Standard	Role of the Teacher
<p>Strategic Reading and Writing includes activities and thinking processes that enable students to apply meaning-making skills and strategies such as using background knowledge, previewing, setting goals, determining importance, evaluating content, generating questions, predicting, and summarizing, etc., to improve reading comprehension and written composition.</p> <p>Strategic Reading and Writing will enable learners to:</p> <ul style="list-style-type: none"> • Use background knowledge through reading and writing activities in a variety of subject areas. • Preview the writing task and set learning goals that are appropriate to them and to the context. • Determine the importance of and evaluate narrative components in discussion groups. • Generate questions, predict, and summarize information gathered from the writing. • Use metacognitive processes to reflect on the writing and the learning processes. 	<p>When using Strategic Reading and Writing, the teacher will:</p> <ul style="list-style-type: none"> • Teach explicitly and model various cognitive strategies for reading and writing. • Help students select appropriate strategies based on characteristics of the learners, the narrative writing task, and the text. • Provide feedback and encouragement during the learning process to both individuals and groups. • Confer with students to encourage reflection on their narrative writing and strategies used.
Connections to Brain Research & Multiple Intelligence Theory	Instructional Framework
<p>The use of Strategic Reading and Writing is supported by:</p> <ul style="list-style-type: none"> • Brain-based Research - Construction of Knowledge, Prior Knowledge, and Metacognition Techniques. • Multiple Intelligences: Verbal/Linguistic, Interpersonal, and Intrapersonal. 	<ul style="list-style-type: none"> • Cognitive System/Input/Output/ Information Processing/Metacognitive/Process Specification and Process Monitoring • Social, Information Processing Models – Indirect, Interactive

Reading and Writing for Meaning

Superior

What the Teaching Practice Accomplishes With THIS Standard	Role of the Teacher
<p>Reading and Writing for Meaning involves the complementary processes of reading and writing allowing the student to approach writing as an author.</p> <p>Reading and Writing for Meaning will enable learners to:</p> <ul style="list-style-type: none"> • Write narrative accounts (e.g., engage the reader by establishing a context and developing reader interest; establishing a situation, plot, point of view, setting, and conflict; creating an organizational structure that balances and unifies all narrative aspects of the story; use sensory details and concrete language to develop plot and character; use a range of strategies such as dialogue and tension or suspense) from the perspective of an author. • Make choices regarding writing styles based on narrative models from reading. • Draw on past experiences and identify with published authors. • Explore reading materials to aid in the understanding of narrative writing. 	<p>When using Reading and Writing for Meaning, the teacher will:</p> <ul style="list-style-type: none"> • Call attention to author choices in narrative writing (e.g., developing reader interest, conflict, organizational structure, sensory details, dialogue, suspense). • Plan reading tasks that will enhance student narrative writing. • Provide graphic organizers that will assist students in organizing the narrative writing (e.g., subject, purpose, audience, form), recording gathered information (e.g., details about an experience, context, point of view, plot, conflict), and ordering that information. • Place students in an author's role as they write to imitate the reading. • Integrate the reading and writing processes during initial instruction as complementary forms of communication.
Connections to Brain Research & Multiple Intelligence Theory	Instructional Framework
<p>The use of Reading and Writing for Meaning is supported by:</p> <ul style="list-style-type: none"> • Brain Research - Activation of Prior Knowledge, Construction of Knowledge, Dual Encoding. • Multiple Intelligences: Verbal/Linguistic and Intrapersonal 	<ul style="list-style-type: none"> • Knowledge System, Cognitive Instructional Strategy/Idea Production and Information Screening • Metacognitive System Instructional Strategy • Information Processing Model - Indirect, Independent

Steps in Processing Literature

Superior

What the Teaching Practice Accomplishes With THIS Standard	Role of the Teacher
<p>Steps in Processing Literature is a procedure that takes the learner through a series of four steps in the development of a natural and profound understanding of various genres of literature.</p> <p>Steps in Processing Literature will enable learners to:</p> <ul style="list-style-type: none"> • Become familiar with the genre, content, structure, and language of literature by using prior knowledge, experiences, and surface features. • Construct meaning through narrative writing as it relates to previously constructed mental frameworks of understanding about narrative writing. • Reflect upon previous knowledge or understanding of narrative writing and rethink what they know. • React to the content, the text, or to the overall narrative writing experience. 	<p>When using Steps in Processing Literature, the teacher will:</p> <ul style="list-style-type: none"> • Choose literature works that allow for thoughtful reflection and reaction from the learners and that can be used as models for narrative writing. • Model the process of integrating prior knowledge with the chosen genre of literature. • Allow students to become immersed in the literature through discussion, debate, narrative writing, journaling, and quiet self-reflection. • Encourage students' reactions to the completed literature study through their writing of narrative accounts utilizing the characteristics learned from reading.
Connections to Brain Research & Multiple Intelligence Theory	Instructional Framework
<p>The use of Steps in Processing Literature is supported by:</p> <ul style="list-style-type: none"> • Brain-based Research - Activation of Schemata and Construction and Processing of Knowledge. • Multiple Intelligences: Verbal/Linguistic, Intrapersonal, Visual/Spatial, and Bodily/Kinesthetic. 	<ul style="list-style-type: none"> • Knowledge System Cognitive Instructional Strategy/Information Processing • Metacognitive System/Metacognition/Language Encoder/Process Specification and Monitoring on Medium of Written Language, Understand and Analyze Topic • Information Processing, Social Models – Direct, Indirect, Individual, Independent, Interactive

Collaborative Concept Mapping

Superior

What the Teaching Practice Accomplishes With THIS Standard	Role of the Teacher
<p>Collaborative Concept Mapping is a cooperative activity that utilizes a visual organizer to place concepts into patterns for clearer understanding. When complete, it is a shared graphic representation that helps students to compare and contrast collaboratively while working out meanings in new information.</p> <p>Collaborative Concept Mapping will enable learners to:</p> <ul style="list-style-type: none"> • Collaborate to identify the critical attributes of narrative writing and depict graphically the characteristics (e.g., context, situation, plot, point of view, setting, conflict, sensory detail and concrete language to develop plot and character). • Represent visually the organizational structure that balances and unifies all narrative aspects of the story. • Connect new knowledge with prior knowledge. • Process new knowledge and process into long-term memory. 	<p>When using Collaborative Concept Mapping, the teacher will:</p> <ul style="list-style-type: none"> • Describe and model a sample mapping before start of the lesson. • Map concepts concurrently with student groups. • Prompt active discussion on pros and cons of content placement. • Provide immediate specific feedback. • Provide questioning and other prompts to encourage brainstorming and discussion.
Connections to Brain Research & Multiple Intelligence Theory	Instructional Framework
<p>The use of Collaborative Concept Mapping is supported by:</p> <ul style="list-style-type: none"> • Brain-based Research - Activating Prior Knowledge and Dual Encoding. • Multiple Intelligences: Verbal/Linguistic, Logical/Mathematical, and Visual/Spatial. 	<ul style="list-style-type: none"> • Knowledge System/Cognitive Instructional Strategy/Information Processing /Organizing Ideas • Information Processing and Social Interaction Models – Direct, Indirect, Collaborative

STANDARD

Demonstrates competence in the general skills and strategies of the reading process.

K - 2 BENCHMARK

Decodes unknown words using basic elements of phonetic analysis (e.g., common letter/sound relationships) and structural analysis (e.g., syllables, basic prefixes, suffixes, root words)

TEACHING PRACTICES

- Phonics Applications – Superior
 - Verbalization – Superior
- Phonological Awareness – Superior
 - Rehearsal of Learning – Superior
 - Vocabulary Action Pictures – Superior
 - Activating Prior Knowledge – Superior
- Analogy and Phonics for Decoding – Superior
- Semantic Representation of Vocabulary – Definition/Description – Superior
 - Teaching Pattern and Organization – Superior
 - Explicit Instruction – Superior
- Language Arts Immersion for the K – 2 Students – Superior
 - Teaching for Transfer – Superior
- Phonemic and Syllable Instruction – High
 - Teaching Heuristics – High
 - Disposition Monitoring – High
- Verbal/Linguistic Vocabulary Building – High
 - Cues and Feedback – High
- Goal Specification or Setting Learning Goals – High
 - Audience-oriented Communication – High
- Contextual Engaged Learning – Relating – High
 - Phonics Plus Context – Moderate
 - Cooperative Learning – Moderate
 - Reflective Questioning – Moderate
- Effective Teacher Presentation Skills – Moderate
 - Personalized Instruction - Moderate

Phonics Applications

Superior

What the Teaching Practice Accomplishes With THIS Standard	Role of the Teacher
<p>Phonics Applications helps students to understand that speech is composed of a series of individual sounds. Students analyze or manipulate the units of speech rather than focus on meaning as they master Phonics Applications.</p> <p>Phonics Applications will enable learners to:</p> <ul style="list-style-type: none"> • Break down and manipulate speech in order to see the relationship of the letters in the writing system to the phonemes in speech. • Produce and distinguish similar and different phonemes during direct instruction. • Practice phoneme isolation, segmentation, and syllable counting. • Blend a set of sounds together to make a word. • Produce a list of rhyming words. • Decode unknown words, using basic elements of phonetic analysis. 	<p>When using Phonics Applications, the teacher will:</p> <ul style="list-style-type: none"> • Direct students to discriminate orally between similar and different phoneme sounds. • Model the process of isolating and reproducing particular phonemes in a word. • Teach phoneme segmentation and counting explicitly (e.g., saying each speech sound in a word, counting out all sounds that were heard, clapping syllables). • Model and instruct the blending of a set of sounds to make a word. • Guide students in rhyming words, deleting particular phonemes, and substituting new phonemes in a given word.
Connections to Brain Research & Multiple Intelligence Theory	Instructional Framework
<p>The use of Phonics Applications is supported by:</p> <ul style="list-style-type: none"> • Brain-based Research - Activation of Prior Knowledge, Patterning, and Construction of Knowledge. • Multiple Intelligences: Verbal/Linguistic, Interpersonal, and Visual/Spatial. 	<ul style="list-style-type: none"> • Cognitive System/Information Processing/Metacognition/Input • Information Processing, Behavioral Models - Direct, Independent

Verbalization

Superior

What the Teaching Practice Accomplishes With THIS Standard	Role of the Teacher
<p>Verbalization involves student expression during the decoding of unknown words, and occurs through self-talk, voicing thoughts, discussion, sharing, and writing about what is being experienced in the learning process.</p> <p>Verbalization will enable learners to:</p> <ul style="list-style-type: none"> • Visualize and verbalize new learning and connections, activate prior knowledge, and build cognitive frameworks for new ideas, concepts, and principles regarding the decoding of unfamiliar words using phonetic analysis. • Utilize the power of dual encoding (seeing it, writing it and talking about it) to assimilate and conceptualize the learning of phonetic and structural analysis. • Communicate new learning through self-talk and/or discussion with peers and instructional leaders. • Explore and communicate ideas and develop an awareness of the way in which their minds work as they monitor their own mental activity. (Metacognition) 	<p>When using Verbalization, the teacher will:</p> <ul style="list-style-type: none"> • Provide an environment that encourages students to voice thinking while monitoring the execution of complex tasks related to phonetic analysis (e.g., common letter/sound relationships) and structural analysis (e.g., syllables, basic prefixes, and suffixes). • Enhance discourse by consistently providing opportunities that stimulate solving problems, raising questions, and presenting solutions. • Encourage the use of self-talk, peer or group feedback, oral presentations, and metacognition to strengthen understanding of word decoding strategies.
Connections to Brain Research & Multiple Intelligence Theory	Instructional Framework
<p>The use of Verbalization is supported by:</p> <ul style="list-style-type: none"> • Multiple Intelligences: Verbal/Linguistic, Logical/Mathematical, and Interpersonal. • Brain-based Research - Dual Encoding, Transfer Bridging, and Metacognition. 	<ul style="list-style-type: none"> • Combined for Higher Impact on Learning With Metacognitive System Process Monitoring Function • Information Processing, Behavioral, Social Models – Direct, Indirect, Interactive, Experimental, Independent

Phonological Awareness

Superior

What the Teaching Practice Accomplishes With THIS Standard	Role of the Teacher
<p>Phonological Awareness is the ability to perceive that symbols signify sounds and that sounds can be blended together to make words.</p> <p>Phonological Awareness will enable learners to:</p> <ul style="list-style-type: none"> • Listen to and reproduce the blending of sounds. • Utilize prefixes, suffixes, and root words. • Interpret the meaning of symbols, sounds and words. • Blend and split syllables. • Perform phonemic segmentation (i.e., counting the number of phonemes in a word). • Perform phoneme manipulation (i.e., adding/deleting a particular phoneme and generating a word from the remainder). 	<p>When using Phonological Awareness, the teacher will:</p> <ul style="list-style-type: none"> • Develop awareness of the connection between letter/sound and syllables/word by presenting the letter(s) and modeling the sound(s). • Model the blending of separate sounds together to make words. • Correct errors promptly and explicitly and sequence reading tasks from easy to more difficult. • Practice and review phonological tasks according to individual student needs.
Connections to Brain Research & Multiple Intelligence Theory	Instructional Framework
<p>The use of Phonological Awareness is supported by:</p> <ul style="list-style-type: none"> • Brain-based Research - Construction of Knowledge, Dual Encoding, and Reinforcement. • Multiple Intelligences: Verbal/Linguistic and Visual/Spatial. 	<ul style="list-style-type: none"> • Knowledge/Informational Domain/Idea Representation/Information Specification and Generalization • Information Processing Model - Direct

STANDARD

Demonstrates competence in the general skills and strategies of the reading process.

K - 2 BENCHMARK

Uses self-correction strategies (e.g., searches for cues, identifies miscues, rereads).

TEACHING PRACTICES

Metacognitive Reading Perspectives – Superior
Teaching Pattern and Organization – Superior
Phonological Awareness – Superior
Analogy and Phonics for Decoding – Superior
Verbalization – Superior
Rehearsal of Learning – Superior
Explicit Instruction – Superior
Activating Prior Knowledge – Superior
Language Arts Immersion for K – 2 Students – Superior
Teaching for Transfer – Superior
Phonemic and Syllable Instruction – High
Disposition Monitoring – High
Cues and Feedback – High
Teaching Heuristics – High
Cognitive/Metacognitive Combinations – High
Patterning – High
Audience-oriented Communication – High
Contextual Engaged Learning – Relating - High
Constructivist Teaching – High
Relaxed Alertness/Stress Reduction – High
P.L.A.N. – Moderate
Phonics Plus Context – Moderate
Reflective Questioning – Moderate
Effective Collaborative Learning – Moderate
Effective Teacher Presentation Skills - Moderate

Metacognitive Reading Perspectives

Superior

What the Teaching Practice Accomplishes With THIS Standard	Role of the Teacher
<p>Metacognitive Reading Perspectives involves the conscious and unconscious awareness of one's own learning and includes the use of texts, tasks, and strategies.</p> <p>Metacognitive Reading Perspectives will enable learners to:</p> <ul style="list-style-type: none"> • Detect organizational patterns or structures during the reading process. • Accomplish specific tasks during the decoding process and then attach meaning to them. • Select from previously modeled processing strategies to resolve decoding and comprehension difficulties. • Develop the skills involved with searching for cues, identifying miscues, and rereading through metacognitive processes. • Use self-evaluation as a part of the learning process. 	<p>When using Metacognitive Reading Perspectives, the teacher will:</p> <ul style="list-style-type: none"> • Facilitate the transfer of students' prior knowledge of decoding strategies to current knowledge of self-correcting strategies. • Introduce and model specific metacognitive reading techniques such as detecting organizational patterns, searching texts for unknown words, identifying miscues, and rereading a word or passage. • Foster self-regulation strategies within students. • Promote self-reflection strategies in the reading process.
Connections to Brain Research & Multiple Intelligence Theory	Instructional Framework
<p>The use of Metacognitive Reading Perspectives is supported by:</p> <ul style="list-style-type: none"> • Brain-based Research - Activation of Prior Knowledge, Construction of Knowledge, and Metacognitive Techniques. • Multiple Intelligences: Intrapersonal, Logical/Mathematical, Naturalist, and Verbal/Linguistic. 	<ul style="list-style-type: none"> • Knowledge System Cognitive Instructional Strategy/Information Processing • Metacognitive System/Process Specification and Process Monitoring Functions • Self System/Metacognition on Purpose and Value/Self Attributes/Efficacy • Information Processing, Social, Personal, Behavioral Models – Indirect

Teaching Pattern and Organization

Superior

What the Teaching Practice Accomplishes With THIS Standard	Role of the Teacher
<p>Teaching Pattern and Organization, a key to improving reading comprehension, is a method that uses visual organizers, discussion, and concrete examples to help students see the pattern or direction that an author is taking.</p> <p>Teaching Pattern and Organization will enable learners to:</p> <ul style="list-style-type: none"> • Increase reading comprehension by demonstrating their understanding of an author's pattern and story concepts as a story is read orally to them. • Provide concrete examples to indicate understanding of the attributes of concepts. • Engage in the learning of self-correcting reading strategies (searching for cues, rereading when necessary). • Participate in discussions and predictions at various intervals in the story. • Create visual images of what is being said. • Build concrete examples of the story concept (e.g., pictures, physical actions, demonstrations). 	<p>When using Teaching Pattern and Organization, the teacher will:</p> <ul style="list-style-type: none"> • Develop lessons that assist students in "seeing the plan" (patterns and story organization). • Model specific related strategies or teach concept building explicitly (e.g., drawing diagrams, identifying critical attributes, engaging in discussions, creating visual images, and building story concepts). • Provide opportunities for controlled, guided, and independent practice in representing the story organization and concepts. • Teach self-correcting strategies explicitly. • Provide acknowledgement and oral feedback as students strive to develop an understanding that print conveys meaning.
Connections to Brain Research & Multiple Intelligence Theory	Instructional Framework
<p>The use of Teaching Pattern and Organization is supported by:</p> <ul style="list-style-type: none"> • Brain-based Research - Dual Encoding, Construction of Knowledge, and Metacognition. • Multiple Intelligences: Intrapersonal, Interpersonal, Verbal/Linguistic, and Visual/Spatial. 	<ul style="list-style-type: none"> • Cognitive System Information Processing/Idea Representation/Metacognitive System Process Monitoring • Information Processing Model - Interactive, Indirect, Independent

STANDARD

Demonstrates competence in the general skills and strategies of the reading process.

3 - 5 BENCHMARK

Decodes words not recognized immediately by using phonetic and structural analysis techniques, the syntactic structure in which the word appears, and the semantic context surrounding the word.

TEACHING PRACTICES

- Phonological Awareness – Superior
- Phonics Applications – Superior
- Analogy and Phonics for Decoding – Superior
- Improving Content Reading and Writing Skills - Superior
 - Verbalization - Superior
 - Rehearsal of Learning – Superior
 - Explicit Instruction – Superior
 - Activating Prior Knowledge – Superior
 - Decoding Through Clues – Superior
 - Teaching for Transfer – Superior
- Phonemic and Syllable Instruction – High
- Metacognitive Strategies for Writing/Reading – High
 - Disposition Monitoring – High
 - Teaching Heuristics – High
 - Cues and Feedback – High
- Cognitive/Metacognitive Combinations – High
- Specific Feedback on Strategy Use – High
- Audience-oriented Communication – High
 - Constructivist Teaching – High
- Contextual Engaged Learning – Relating – High
 - Differentiated Instruction – High
 - P.L.A.N. – Moderate
- Phonics Plus Context – Moderate
- Partner Work – Moderate
- Personalized Instruction - Moderate

Phonological Awareness

Superior

What the Teaching Practice Accomplishes With THIS Standard	Role of the Teacher
<p>Phonological Awareness is the ability to perceive that symbols signify sounds and that sounds can be blended together to make words. This practice is utilized throughout the reading process.</p> <p>Phonological Awareness will enable learners to:</p> <ul style="list-style-type: none"> • Decode words not recognized immediately. • Utilize prefixes, suffixes, and root words. • Use phonetic and structural analysis techniques. • Perform phonemic segmentation (e.g., counting the number of phonemes in a word). • Perform phoneme manipulation (e.g., adding/deleting a particular phoneme and generating a word from the remainder). 	<p>When using Phonological Awareness, the teacher will:</p> <ul style="list-style-type: none"> • Develop awareness of the various methods for decoding words, including phonetic and structural analysis. • Model the blending of separate sounds together to make words. • Correct errors promptly and explicitly and sequence decoding tasks from easy to more difficult. • Practice and review phonological tasks according to individual student needs.
Connections to Brain Research & Multiple Intelligence Theory	Instructional Framework
<p>The use of Phonological Awareness is supported by:</p> <ul style="list-style-type: none"> • Brain-based Research - Construction of Knowledge, Dual Encoding, and Reinforcement. • Multiple Intelligences: Verbal/Linguistic and Visual/Spatial. 	<ul style="list-style-type: none"> • Knowledge/Informational Domain/Idea Representation/Information Specification and Generalization • Information Processing Model - Direct

Phonics Applications

Superior

What the Teaching Practice Accomplishes With This Standard	Role of the Teacher
<p>Phonics Applications helps students to understand that speech is composed of a series of individual sounds. Students analyze or manipulate the units of speech rather than focus on meaning as they master Phonics Applications.</p> <p>Phonics Applications will enable learners to:</p> <ul style="list-style-type: none"> • Break down and manipulate speech in order to see the relationship of the letters in the writing system to the phonemes in speech. • Produce and distinguish similar and different phonemes during direct instruction. • Practice phoneme isolation, segmentation, and syllable counting. • Blend a set of sounds together to make a word. • Produce a list of rhyming words. • Practice deleting and substituting phonemes in a given word. • Use this strategy for decoding words that are not recognized immediately. 	<p>When using Phonics Applications, the teacher will:</p> <ul style="list-style-type: none"> • Direct students to discriminate orally between similar and different phoneme sounds. • Model the process of isolating and reproducing particular phonemes in a word. • Teach phoneme segmentation and counting explicitly (e.g., say each speech sound in a word, count out all sounds that were heard, clap syllables). • Model and instruct the blending of a set of sounds to make a word. • Guide students in rhyming words, deleting particular phonemes, and substituting new phonemes in a given word.
Connections to Brain Research & Multiple Intelligence Theory	Instructional Framework
<p>The use of Phonics Applications is supported by:</p> <ul style="list-style-type: none"> • Brain-based Research - Activation of Prior Knowledge, Patterning, and Construction of Knowledge. • Multiple Intelligences: Verbal/Linguistic, Interpersonal, and Visual/Spatial. 	<ul style="list-style-type: none"> • Cognitive System/Information Processing/Metacognition/Input • Information Processing, Behavioral Models - Direct, Independent

Analogy and Phonics for Decoding

Superior

What the Teaching Practice Accomplishes With THIS Standard	Role of the Teacher
<p>Analogy and Phonics for Decoding helps students to decode unknown words by using words or word parts that they do know. It involves drawing analogies between the known and unknown and using decoding procedures for key words with common phonogram patterns and words parts.</p> <p>Analogy and Phonics for Decoding will enable learners to:</p> <ul style="list-style-type: none"> • Utilize word-learning strategies (e.g., phonetic and structural analysis techniques, syntactic structure, semantic context) as they read connected text. • Use this reading strategy to develop metacognitive awareness and control over their own word learning. • Explore letter-sound matches in unfamiliar words by reviewing what they have learned about words. 	<p>When using Analogy and Phonics for Decoding, the teacher will:</p> <ul style="list-style-type: none"> • Model how to figure out the meaning of a new word (i.e., <i>medic</i>) by thinking about the meaning of a familiar word (i.e., <i>medical</i>). • Provide instruction for the process of analogizing for decoding and pronunciation. • Teach phonetic decoding strategies explicitly (e.g., connecting letters and sounds, pronouncing words while identifying the number of sounds in the word, using self-talk and guided practice to analyze word sounds). • Implement a partner-sharing component for increased understanding of the decoding process.
Connections to Brain Research & Multiple Intelligence Theory	Instructional Framework
<p>The use of Analogy and Phonics for Decoding is supported by:</p> <ul style="list-style-type: none"> • Brain-based Research - Activation of Prior Knowledge, Construction of Knowledge, and Metacognitive Techniques. • Multiple Intelligences: Intrapersonal, Logical/Mathematical, and Verbal/Linguistic. 	<ul style="list-style-type: none"> • Cognitive System/Information Processing/Metacognition/Input • Information Processing, Behavioral Models - Direct, Independent

RECOMMENDATIONS FOR PROFESSIONAL DEVELOPMENT

The Learning Bridges Instructional Intervention Plan, accompanied with recommendations for staff development, addresses instructional decision-making. It provides teachers with the information they need to make sound decisions when choosing instructional teaching practices to use for specific kinds of knowledge that they want students to learn. The expectations for student learning are identified by the benchmark standards. For each benchmark standard that Bryn Mawr Elementary School has identified as in need of improvement, the Instructional Intervention Plan provides teachers and administrators with the top 25 teaching practices, in rank order, that will make the most difference in learning.

Learning Bridges offers both face-to-face and on-line classes that address most of the variables that impact academic achievement. In addition, training provided in the teaching practices is aligned to the school's TARGETED benchmark standards. The result is CLASSROOM INSTRUCTION ALIGNED TO STANDARDS by teachers skilled in the delivery of the most effective instruction. This will result in highest INCREASE IN STUDENT LEARNING AND ACHIEVEMENT.

Given the targeted benchmarks identified by Bryn Mawr Elementary, the following is a synthesis of the most effective instructional teaching practices to impact student performance. These teaching practices reflect the top 5 for the twenty-two (22) benchmarks identified by Bryn Mawr Elementary School.

SYNTHESIS OF LANGUAGE ARTS TEACHING PRACTICES

- Metacognitive Reading Perspectives
 - Reading and Writing for Meaning
 - Concept Mapping
- Idea Representation to Learn Vocabulary
 - Teaching Pattern and Organization
 - Explicit Instruction
 - Phonics Applications
 - Phonological Awareness
 - Analogy and Phonics for Decoding
 - Rehearsal of Learning
 - Steps in Processing Literature
 - Verbalization
- Language Arts Immersion in K – 2
 - Strategic Reading and Writing
 - Multiple Vocabulary Repetitions
 - Content Comparisons
- Manipulation of Concrete Representations with Computers
 - Vocabulary Action Pictures
 - Literacy Across the Curriculum
 - Semantic Mapping
 - Compare and Contrast
 - Vocabulary Through Context
 - Improving Content Reading and Writing

Vocabulary Strategies to Improve Comprehension

Mind Mapping for Skill Review

Critical Thinking Skills

Decoding Through Clues

Discussion and Analysis

Concept Attainment

Activating Prior Knowledge

DO YOUR TEACHERS KNOW HOW TO DELIVER THESE INSTRUCTIONAL TEACHING PRACTICES IN THE CLASSROOM?

Learning Bridges recommends that your teachers be allowed to CHOOSE which of these teaching practices they will learn. All of them are effective for the targeted standards. Teachers have different styles; they have different skills. Allow them to choose to learn a teaching practice that will fit their teaching style and the school's delivery model, yet make a significant difference in student learning.

For the ten (10) new teachers, you may want to assure proficiency in each of the top 10 identified instructional classes over the next 2 years. For experienced teachers, you may want to provide access to 2 – 4 teaching practices classes per year. In the next 3 to 4 years, it is recommended that every one of Bryn Mawr’s teachers attain the same high level of proficiency in delivering instruction utilizing the most effective teaching practices available to improve student learning and achievement. **Bryn Mawr teachers, in exchange for participating in the McREL Evaluation Project, will be able to access 4 modules over the next two (2) years without charge.**

Learning Bridges Online Professional Development

It is recommended that Bryn Mawr Elementary teachers be provided access to the following course options:

ONLINE CLASSES THAT ADDRESS THE TEACHING PRACTICES:

Activating Prior Knowledge	Strategic Reading and Writing – Part 1
Critical Thinking Skills	Strategic Reading and Writing – Part 2
Compare and Contrast	Strategic Reading and Writing – Part 3
Concept Mapping	Strategic Reading and Writing – Part 4
Pattern and Organization	Decoding Through Clues

Discussion and Analysis	Explicit Instruction/Heuristics – Part 1
Graphic Representation/Organizers	Explicit Instruction/Heuristics – Part 2
Improving Content Reading and Writing Skills – Part 1	Verbalization
Improving Content Reading and Writing Skills – Part 2	Phonics Applications
Concept Attainment	

The Learning Bridges Online Professional Development System meets all of the requirements for the National Professional Development Standards.

LEARNING BRIDGES ONLINE CLASS COMPONENTS:

1. **Getting Started** – Teaches navigation, tools, and buttons
2. **Course Overview** – Course Description, Syllabus, Rubric
3. **Course Pretest** – Key that unlocks the other components
4. **Terminology** – Teaches concepts, vocabulary (Lessons 1 – 2)
5. **Course Content** – Teaches the impact on learning, connections to brain research and multiple intelligences, provides modeling and guided practice (lesson planning, implementation, and evaluation), and provides a performance-based application in the real classroom. (Lessons 3 – 7)
6. **Reflections/Evaluation** – Final Reflections and Post Test (Lessons 8 – 9)

Learning Bridges online classes are delivered as 8 – 10 hour modules. Teachers will have access to an online class module for 2 weeks to complete the learning and become proficient with the teaching practice. All classes are instructor-led, collaborative, and performance-based to ensure that proficiency is attained. Opportunities are provided to share ideas and materials with colleagues, to receive explicit feedback from the instructor, and to reflect both on the learning

itself and on how the teacher learned it, as well as how it will be immediately applied in the teacher's classroom. Virtual tools are utilized to demonstrate the teacher's learning and thinking. Graduate credit is available from California State University – Bakersfield for teachers who choose this option.

The Learning Bridges Online Professional Development System enables teachers to deliver the most effective instruction available for targeted standards **without** disruptions to the classroom. Learning can occur anytime, anywhere with access to a computer and an Internet connection. Teachers will become proficient in using the most effective teaching practices -- aligned to the specific knowledge of the state standards. It eliminates the cost for substitute teachers, travel, and materials. After teachers take part in Learning Bridges Online Professional Development, schools can be assured that the most effective teaching practices are now included in the professional repertoire of those teachers. Those practices can then be utilized to improve student learning in reading at Bryn Mawr Elementary School every single day.

Bryn Mawr teachers will be given a **user name and password** through which they can register for classes on effective teaching practices following the debriefing of the Instructional Intervention Plan.

Respectfully submitted:

Sandra K. Darling, Ph.D.

President, Learning Bridges®

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